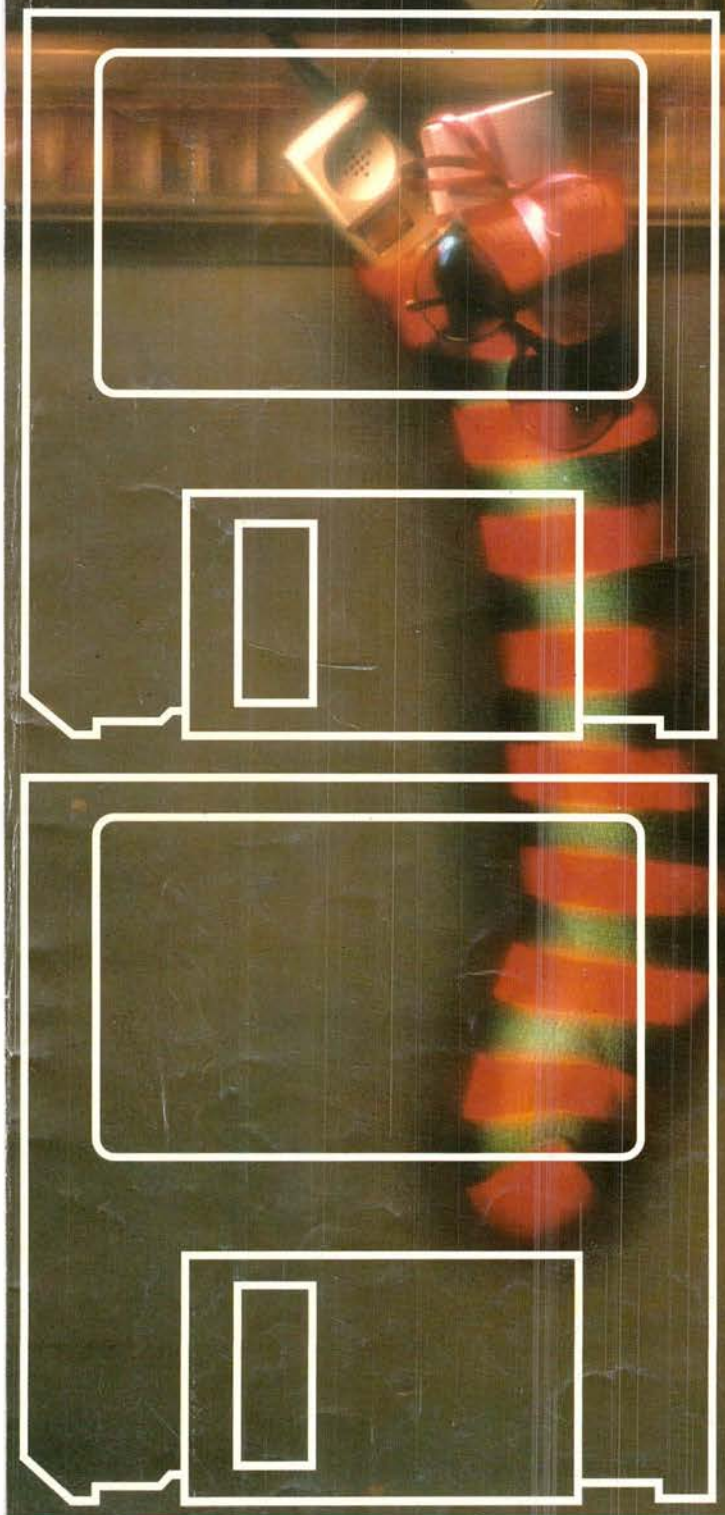
Covering all Acorn machines

Acorn COMPUTING



Extravaganza...

- Step-by-step DTP: two special Christmas projects
- The latest in entertainment: Simon the Sorcerer, Sim City 2000 plus more

Plus

- Machine architecture
- Acorn online
- Vector graphics
- Acorn in the field

And all the regulars & reviews

SPECIAL 1994 Vol.12 No.11 £3.95 HFl 17.95

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IDG MEDIA

Risc PC • Archimedes • A300 series • A400 series • A3000 series • A4000 • A5000

New Releases...

IMPRESSION PUBLISHER PLUS

A new professional edition of the best selling Impression DTP program.

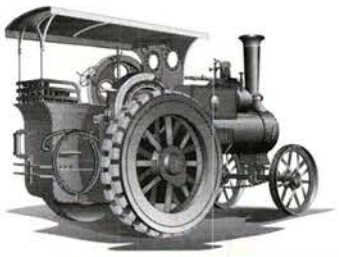
This version offers enhanced colour control (named and spot colours), EPS and OPI support for professional full colour DTP work.

Publisher Plus

£299 + VAT (£351.32 inc)

Upgrade from Impression Publisher

£130 + VAT (£152.75 inc)



ClipArt2 CD

The results of the second ArtWorks clip-art competition. This CD includes over 500 new clip-art examples, plus all those included in the ArtWorks package.

It also contains a new collection of high quality 24-bit JPEG and TIFF compressed photographs.

ClipArt2 CD

£ 19 + VAT (£22.32 inc)

NETWORK SPOOLER
FOR TURBODRIVERS & LASERDIRECT

This package includes a copy of the TurboDriver software and network spooler software allowing any machine connected to an AUN compatible network to print to a common printer. The software also supports LaserDirect printers and includes an unlimited network site licence.

Network Spooler

£149 + VAT (£175.07 inc)

Formulix

A completely new mathematical and equation formulae editor. Outputs Drawfiles and is OLE compatible allowing it to integrate with suitable applications such as Impression Style and Publisher. Features include full undo, WYSIWYG display, matrices, drag and drop etc.

Formulix

£69 + VAT (£81.07 inc)

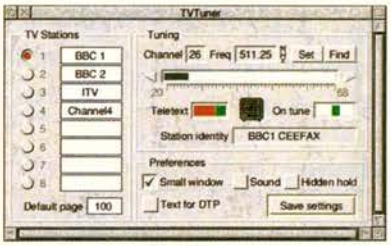
Upgrade for existing Equasor owners

£49 + VAT (£57.58)

...What's new from Computer Concepts this Autumn for Acorn RISC Computers

TV TUNER

An expansion card consisting of a TV Tuner module that can output composite video signal (TV can be watched either on a separate monitor, or on your computer screen via a suitable video digitiser). Optional Teletext software allows Teletext pages to be viewed on screen, and saved as text or sprites etc.



TV Tuner
£89 + £6 p&p + VAT
(£111.62 inc)
TV Tuner + Teletext Software
£169 + £6 p&p + VAT
(£193.87 inc)

PRESSURE SENSITIVE GRAPHICS TABLETS

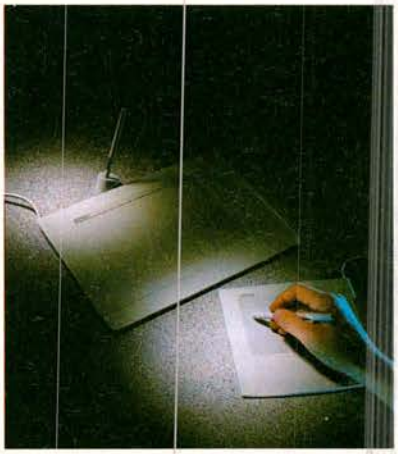
The brand new ArtPad graphics tablet from Wacom. A near A6 pressure sensitive tablet that offers over 2000dpi resolution, 256 levels of pressure and cordless pen. Can replace or work alongside the mouse. Compatible with all applications including 'pressure' capable programs such as Photodesk & the Eesox ArtWorks Pressure Tool.

Wacom ArtPad
£169.00 + VAT (£198.57 inc)
Wacom A5
£399.00 + VAT (£468.82 inc)
Wacom A4
£549 + VAT (£645.07 inc)

MOVIE Magic

Amazing new expansion card for Risc PCs, allows full motion, full screen video with CD quality stereo sound, to be obtained from standard MPEG movie files. With a compatible CD player it can play VideoCDs to provide better than VHS quality video. Scart RGB video output to a suitable (ie PAL frequencies) monitor. An optional upgrade (available later) allows video in a window on a Risc PC as an alternative to video out.

Movie Magic
£249 + £6 p&p + VAT
(£299.62 inc)
Movie Magic Video in a window - available later £TBA

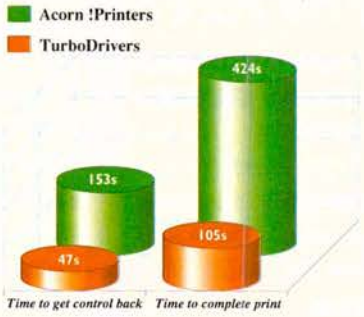


VERSION 4 RISC OS 3 Turbo DRIVERS

The latest version of the TurboDrivers supports Acorn !Access network software, is compatible with the Risc PC and the latest versions of !Printers.

Now offers better colour control and very significant performance gains over any alternative printer drivers - typically it's between two and ten times faster ! Versions available for all the popular inkjet printers.

Risc PC TurboDriver timings



Please specify printer when ordering. Requires Risc OS 3.1or later.

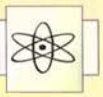
TurboDriver Canon
£49 + VAT (£57.58 inc)
TurboDriver HP -
£49 + VAT (£57.58 inc)
TurboDriver Epson - includes support for Epson Stylus Colour -
£49 + VAT (£57.58 inc)

Computer Concepts Ltd

Gaddesden Place, Hemel Hempstead, Herts, HP2 6EX Tel 01442 63933 Fax 01422 231632
Email info@cconcepts.co.uk

500 LOWCOST FONTS

SKYFALL



Font Pack 1

Buckingham Friendly Jotter
garden Chicken
Schwarz Select
THEATRE Ladybird
Amber Milton Keynes
Gangster Bit Columbia
Bolt Classic Koch
Palatino Hardcase Swizz
Oxford Citric Trio
Reiner Baskerville
Cooper Black Old English
MegaType Park Avenue
YOUNG Brush Script
Acorn TECH Jayne
STENCIL Orange
SPLODGE Dubiel
ALGERIAN SOLID
Balloon Lazy Σψμβολ
Raven George
STOP Italic
Cybernoid XRMMk II

Font Pack 2

POST CRYPT Murder
Fox Script Ricksaw
Informal Chasline
Architect Phaedrus
Chinese Kathlita
TERMINATOR Borzoi
Thalia Caligula Alison
Psychadelic El Garrett
Heidelberg Jackson
Laser Square Black
Andromeda Charlie
FLINTSTONE Conaith
METRO LINER Future
Кириллиц EDDA LED Style
CAVEMAN Video Graphic
Jumbalaya Oregon
Daytona Windsor PONCHO
BUBBLE SNYDER
New Sweet SPHERES
TOY Gordon DEUSEX
China Town STRONGMAN

Font Pack 3

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TAX USA Juliet
POINT HIGH SCHOOL
RED SQUARE
Oak Wood Romeodn
JUNK FUNK QUIZ SHOW
Apollo Good City
annie SPURS american
KRAMER Koshgarian
Notepad My Words
King William Broken Henry
Camelot Rechtman Duncan
CUSTOGLION РУССКИЙ
Lauren UPPER WEST
Micro WEISS LICHTNER
CLUMSY RACKHAM
GRUMAN Hot Shots
Mushy BRAIN ICED UP
TRIBE Science Cairo
Mardi Faktos ZALESKI

Font Pack 4

PURE METAL NEW YORK
SALTER METROPOLIA
Chalk FIRE WATER
ELF JAZZ JEEVES & WOOSTER
Black Adder II Vampires
GREEN Rain BONES
First Words Royal Lucas
Birthday LOMBARDIC
Gessele Paganina
Creedmore BENNY
KING HORSE Chopin
Beatville MANIA
DINER rabbit ears
ARE Medusa SPARK
ANTIQUE Fundage
Digit CAD Muncho Madrid2
Gexo Gallais Lilith
Anquillia MAZAMA Flemish
EDITION STEMS Dickens
CARADIS FoxTrot
Mixam KEYS 1000

Font Pack 5

Liberal Casual Paradox
Ink Blot Arabian
Care Free Maidstone
Skippy Dragon Wick
Phoenix Pixie Under Space
REALWood Wood Strip
ZenyRenton CHEQUE
ASSORTMENT luxembourg
EIRE NEON Polo
Bad Boy Sans Serif
IMPRINT RELIEF X
Poor Type DotMatrix
Genoa Mira Scout
FOLDER Nordic Fred
Coliseo Marquis
DELTA SHARKTOOTH
ひまわり
FELTPEN FeltMarker
LOVE PEACE Eye Brow
Bulerworth Harrington
Cracked Big Town
Caraway STUART Arctic

Font Pack 6

RoughBrush SHRAPNEL
DINOSAUR STARBURST
InkyType RHYOLITE
Pure Babe Premium
Restrictions Natural
Azward SKOOLKID2
Jazzy Lines SNAZZY Frog
bent wires Ola Messy
BellBottom Pieces
Wide Base CROSSROADS
Cross Wits MultiLine
CHASER
GRUBBY
DIGGER Western 1
STERLING Western 2
Bradford LED White WESTERN 3
Empty Times Open WESTERN 4
Prefix ZIPALONG Yamato
ZARROW RELIEF R
BEEF WAR Skull TECTONT

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Exposed EricContor
GLASSLITE
WETPAINT HAPPYHOUR
NLQ InkJet HEADBANGER
Knotted HORRORPLUS
Nicked Freaky Horizlines
ROMANBLANC
MOTEL
SAND Elroyan SKILINE
ENGRAVER Spikestripe
SysError ZapOpen
Futurefia Faustus GREKO
DownWind Weird
After Sliped Upright
ApexRix Camberic
EDGED White COMB
Brocks CROSSCRACK
Brighton
SCRATCH Vincent Cyborg
Ballet Flawed
Cheers Zeppo
DingDong FLASH

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Minster Mister ANTHUN
BANDS
BlancBoy SHOT cheese
COMPUNI Dashing
Defective Neu Dirty
Middleton Oldie2 PIGGY
Mirisch Adie3 InSilicon
ISADORA WHITESPARK
Kelvin Always Jagger
לדוגמלהש Laurance
תאלשכמש Oregon Wet
ΔΠΝΟΙΚΠΠ MERRY
Stroked NOVFOOD
Stumpy MOREGIENCE
PIMXRMD Rudelsberg
PAPERCLIP HISTORIC
SCRIPTUNE Muriel Spoted
Oliver Serpentine
LYNX MESOZOI
Home Away SPRAYED
LOOP DE LOOP ZEBRA

Font Pack 9

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ALGERIAL IMPORTANT
Soft LIFFO
Ayreshire LIVECITY
BIKO silky Lights
BlokiBlues Locking
Celtic SNOWY
Chicago Striker Meat
ClassicNib
ClearCut SPARKED Miami
Columbus Not Silcn
CRYSTAL NOUVEAU
Diamonds OMNIBUS
Dobkin Silver Question
DraftTwo Flowers
Farlow ROLLER
FASTWRITE SaintFonts
ReLive SoftWords Shaken
WESTERN5
System X WESTERN6
SOLIDTOOTH WESTERN7

Font Pack 10

MatchMaker NightTime
DarkAges Royal Words Sporty
GT CLASSIC SprayOn
ST GENERATION VeryFat
ToonTown
ST MONITOR Wezley
ST Movie TOMBSTONE
ST Titles WiseWords
Draftsman Dunkin Kanza
ENVIRO Stringy Dracula
SS Open TallBeam StrongThin
Eras Stage FreeOpen
Housey Companion Thomas
SWEDETBOX YearBook
SWEDETSHOP SansSerif2
Tangled GeorgeOpen
LadyLike Retro DaisyChain
LIMITS TEAM SOLID
SwirlyWord TEAM USA
Roundary TEAM WHITE
Nineteen DataFace

Format Discs per pack	DD 4x800k	HD 2x1600k
Single packs	£8	£6
Any 3 packs	£20	£16
Any 5 packs	£30	£22
All 10 packs	£52	£38

Low cost, good quality RISC OS Outline Fonts are now available in abundance from Skyfall. Why pay more, when our standard fonts will work with all font utilizing applications, such as Impression, Pendown, Draw and Ovation. Available on either 800k or 1600k discs, with graphical contents labels and installer files.

Postage free for UK and Europe, elsewhere please add £0.50 per disc. Official orders are welcome.

Skyfall
BOX 2220 BIRMINGHAM B43 7SF
TELEPHONE 0121 358 7078

Next issue on sale 29th December 1994

Seasonal Celebrations

IN this Special issue of Acorn Computing we provide six pages of special do-it-yourself DTP information, advice and clip-art so that you can make this Christmas extra special.

Starts on Page 18.

REGULARS

Comment 11
When you buy a piece of software, what right do you have to demand that it is completely bug-free?

News 13
All the latest news of products and events taking place in the fast-changing world of the Acorn computer.

TechForum 42
Are you an expert programmer? Our hints and tips series is just for you with ideas and algorithms to help you work.

Mad Hatter 50
Our very own adventure wizard continues to help you explore worlds of fantasy and excitement.

Public Domain 59
Teri Paul is back again with her pick of public domain and shareware programs to enhance your computer.

Problem Solved 71
Our technical editor opens his mail and shares the secrets behind some of those tricky hardware problems.

Body Building 73
Mike Cook reveals how to build a touch screen for Acorn 32-bit machines.

Letters 80
This is your opportunity to voice your news, ideas and views on everything in the Acorn world from viruses to joysticks.

FEATURES

MegaDisk 6
Check out what's in store for you this month on the best cover disks available for the Acorn 32-bit RISC OS range.

DTP Project #1 18
The first of our two special seasonal DTP articles, giving you the tools and resources to do it yourself.

DTP Project #2 25
The second of our two special seasonal articles featuring a brand new easy-to-use DTP package called TextEase.

Going online 29
To join the comms revolution you need a modem – we help you choose what's best for you.

Acorns in the Field 33
We report on how four Acorn computers were put into an unusual environment – and survived unscathed.

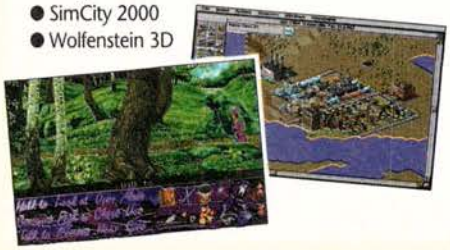
Machine Architecture 37
The first of a new series that explores the components of Acorn computers and how they work.

Real 3D graphics 45
Continuing the series, we find out what is the fastest way of drawing a single horizontal line.

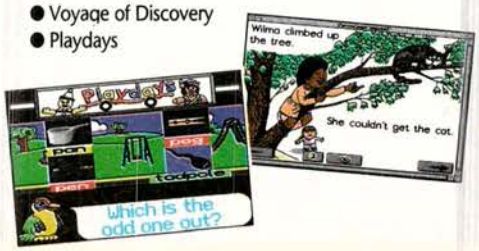
BBC Disk 79
Full details on the subscription disk for the 8-bit BBC Micro and how to use it.

REVIEWS

Screenplay 53
The latest game reviews and previews for the 32-bit machines:
- Simon the Sorceror
- E-Type 2
- SimCity 2000
- Wolfenstein 3D



Learning Curve 62
We survey the latest in educational software for the Acorn computers:
- Langdale CD
- A Mouse in Holland
- Voyage of Discovery
- Playdays
- Oxford Reading Tree



THE MEGADISKS

Britain's best Acorn cover disk contains hours of fun and a host of useful utilities linked to our editorial features to make the magazine come alive on your desktop.

Full details about the packed Megadisk – see Page 6.

- **Wolfenstein 3D**
  A game and a half with furious 3D action
- **TextEase**
  Demo of the new low-cost DTP package
- **PowerCarols 3**
  Seasonal music with a touch of beat
- **DTP Project #1**
  All the clip-art and templates for you to use
- **DTP project #2**
  The finished carol sheet for you to dissect
- **TechForum**
  Fast division, font changes and printer selection
- **Real 3D Graphics**
  Example routines to test on your machine

Subscribe now! – See page 68

SUBSCRIBE to *Acorn Computing* and you'll get an amazing value-for-money deal that beats all our rivals: Not only do you get a whole years-worth of issues you get TWO disks every month plus unbeatable software – free!

See Page 68 for details of this unbelievable offer.

GET YOUR NEWSAGENT TO RESERVE YOUR COPY NOW – SEE PAGE 48
AVAILABLE AT W.H. SMITH AND ALL GOOD NEWSAGENTS

Most of the editorial and adverts in this magazine were produced with ArtWorks and Impression from Computer Concepts.

The MegaDisks

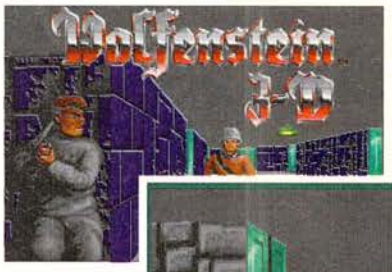
Disk One

- Wolfenstein 3D
- Christmas Project 2
- Christmas clip art
- Programs from the magazine

Disk Two

- TextEase
- Christmas Project 1
- PowerCarols 3

Wolfenstein 3D: Seek and destroy



● *I'm ready to get the drop on this guy*

● *I feel a little beaten up and low on ammo*

● *A machine gun versus a knife is certainly not cricket*

EXCLUSIVE for you is this three-level version of Wolfenstein 3D. This mega-successful game on the PC has been converted by Eddie Edwards' team at Powerslave Software, and the full game consists of 60 levels and costs £30.

Load the game and you'll find yourself in the fourth decade of the twentieth century in a mid-European dictatorship. This country is at war with your own and as a loyal soldier your mission is to eliminate the enemy. You have a hand gun at your disposal and luckily, ammunition can be found as you explore. If you don't find any more bullets you'll have to trust your knife. You have three chances at success.

This version of Wolfenstein 3D lets you take the role of William BJ Blazkowicz who was captured and imprisoned during a reconnaissance mission to discover the plans for Operation Eisenfaust. Being an officer and a gentleman, he escaped. But now you have to guide him through the castle collecting food, ammunition and treasure as you go and annihilating guards – human and canine.

Powerslave Software's future plans include a level editor for Wolfenstein 3D. It hopes to get one written with a 3D preview of the maps, sprite editing and importing, sound importing, exporting of graphics and sound. When finished, it plans to release it into the public domain.

Keys:

Up arrow	Forwards
Down arrow	Back
Left/right arrows	Rotate left/right
Alt + Left/right arrows	Moveleft/right
Ctrl	Shoot
Shift	Run
Space	Open
F7	Smaller window
F8	Larger window
Escape	Back to title screen

You will have to de-archive this program on to a floppy or hard disk before running. If you are running Wolfenstein with a multisync monitor you'll need to edit the Run file. The last line should then read: <Wolf$Dir>.WolfLoad -msync. This means that the game will now run in Mode 49, one of Acorn's special VGA *game modes*.

● *One life left but which door do I take?*

Christmas Projects: DIY DTP

THIS issue of the magazine contains two projects to make your Christmas go with even more of a swing.

Steve and Ann Bruntlett have created some superb designs in Draw so you can create your own Advent Calendar, the 12 Days of Christmas and assorted boxes, decorations and nativity scenes.

Using the new presentation package TextEase, Bruce Goatly explores the principles of DTP when creating documents for a purpose – in this case an order of service for a Carol Service.

The clip art and sample documents can be found on the disks along with a sample of Christmas clip art from PES for you to use.

TextEase: DTP for the terrified

THIS is a new product from software house SoftEase (01684 73173 or 01332 204911) and this is a very special version of the software available only to readers of *Acorn Computing*. The standard version of the software costs £25 inc VAT until 1st February, then it costs £25 plus VAT.

TextEase is a very easy-to-use desktop publishing package – turn to page 25 of this month's issue and see what Bruce Goatly created using it. All the information you need is provided in TextEase documents on the cover disk. The MegaDisk version has no save option and limited printing facilities, but all the other options are available to you.

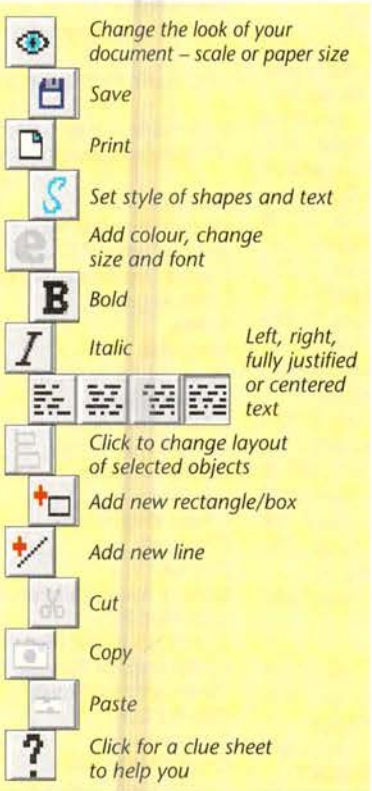
You can run TextEase from hard or floppy disk. The package comes with a range of tutorials which can be read from screen or printed out. These will show you how to make the most from this presentation package and includes fonts and clip art from Skyfall and Desktop Projects respectively.

All the options are available to you via the button bar at the top of each document or via menus and sub-menus if you prefer. On-line help is available at all times, making TextEase a superb package for those new to Acorn machines or bemused by the names and volume of facilities available to you on some of the larger DTP packages.

TextEase is very intuitive to use and you can create anything from an address list to a party invitation in a matter of minutes. As well as the standard operations such as cut, copy and paste, there is instant dragging and sizing of objects, styles and effects to give your work that professional feel and the ability to add draw and sprite files at will.

You can also have multiple views of the same document at different scales so you can make fine adjustments, and can choose from paper sizes between A5 and 9mx9m, with gluing and clipping marks to make it easier to stick sheets together.

You can add boxes/frames and shadows to text and also shapes. Work can be saved as TextEase, draw files or text. All you need is 1Mb of ram and RISC OS 3.



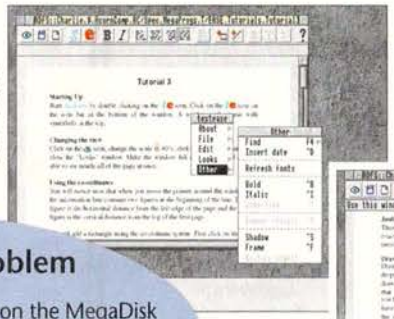
FAULTY DISK?

If your cover disk or 32-bit subscription disk has a physical fault – doughnut won't rotate in the sleeve, disk errors and so on – please return it for replacement to:

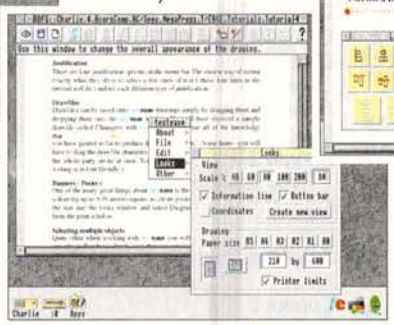
PC Wise Ltd
Dowlais Top
Business Park
Dowlais
Merthyr Tydfil
Mid Glamorgan
CF48 2YY

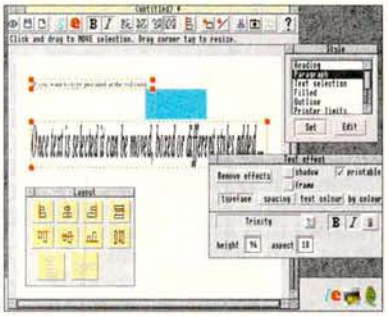
If there seems to be a fault with one of the programs please contact the magazine by post describing your machine set- up and exactly what happens when you run the program.

● *TextEase comes with a range of useful options: Insert date, count words and so on*



● *Change your layout with a click and add clip art where you like*





● *One of the most ingenious features of TextEase are the tear-off menus*

TextEase Risc PC problem

The demonstration version of TextEase on the MegaDisk displays rectangles incorrectly on high resolution Risc PC screen modes. When using the demo we suggest that you use a screen resolution of 800 x 600 pixels or less. This problem has been corrected in the current version of TextEase, 1.02.

PowerCarols 3 meets Rudolph

For your amusement and listening enjoyment, this year's PowerCarols combines with a desktop silly. On loading you'll be greeted by a medley of tunes called *Rudolph's Dance Party*. On the iconbar, a rotating reindeer will appear as well as a window telling you how many days there are until Christmas, plus a screen saver.

You can add your own draw files to the screensaver too. Inside the application is a folder called Files. If you put some draw files inside it, it will use them as a screensaver by randomly drawing each one. The screensaver's time is set to two minutes by default and if you want to change it, there is a system variable in the !Run file to change.

Rudolph's Dance Party or Where has my Carols for Choirs gone? is the third in the series of Power Carols musical extravaganzas.

● *Due to problems with the Tracker module this program will not work on a Risc PC.*

Matthew Bloch and James Coates

Programs from the magazine

TechForum	FastDiv, FontChange and PIconer
3D Graphics	3DLib, LineTest

Risc PC de-archiving problems

Due to a problem with ACMenu, files cannot be de-archived from the ACMenu window on the Risc PC, and a memory error is generated, regardless of how much your machine has. We are having this problem addressed as quickly as possible.

Until that's sorted out, simply double-click on the archive icon, for example 9413/1, then follow the directory structure as usual until you find the program you want and drag it out of the archive to the destination disk.

ICS

0151-625 1006

Selected prices 11th November 1994

New products

A3010 2M Early Years ACOR £399
A3010 2M Early Years with SVGA Multiscan Monitor ACOR £499
A4000 2M HD210 Early Years with SVGA High Resolution Multiscan Monitor ACOR £949
A4000 2M HD210 Early Years with SVGA Multiscan Monitor ACOR £899
Risc PC 600 2M HD210 Early Years 14" Monitor ACOR £1269
Risc PC 600 2M HD210 Early Years 17" Monitor ACOR £1669
Risc PC 600 5M HD210 Early Years 14" Monitor ACOR £1429
Risc PC 600 5M HD210 Early Years 17" Monitor ACOR £1829
Risc PC 600 9M HD420 Early Years 14" Monitor ACOR £1729
Risc PC 600 9M HD420 Early Years 17" Monitor ACOR £2129
Bubble Jet BJC-4000 CANO £339
Clip-Art CD 2 COMC £18
Formulix COMC £67
Impression Publisher Plus COMC £285
Impression Publisher Plus as upgrade from Impression Publisher COMC £125
Playdays, age 3-8 GAME £19
Sibelius 6 primary site licence SIBE £299
Sibelius 6 secondary site licence SIBE £599
Sibelius 7 site licence SIBE £1450
TV Tuner COMC £88
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IT was over a year ago that I tackled what I consider to be one of the foolishnesses of computer science, the question of *proving* program correctness. Briefly, the idea is that by applying proper mathematical techniques you can *prove* that a program works correctly, 100 per cent of the time.

While I consider this to be an unachievable goal, the *effort* to achieve it is not wasted. A lot of valuable program development ideas have come out of it, and the properly trained programmer can use these techniques to reduce the obvious logical errors in his work.

Assuming that programs will never be perfect or free from error, this presents the software producer with a problem: How secure must a program be before it's released to the unsuspecting public?

Have you ever found a bug in a program? Had one hang up on you? Lost hours of work due to an unexpected crash? I know I have.

There are two known stages to program testing. The alpha stage is performed by the programmers who test it as they develop, although in larger organisations the early testing may also be performed by a separate department armed with huge batteries of tests.

The main problem with programmers testing their own software is that they know how it's supposed to be used. So they test rigidly defined pathways through the code – because they are the *right* ones – and those paths will be completely bug-free.

Unfortunately, real users don't do that. They wander off into strange by-ways of code where the programmer never thought anyone in their right minds would go. And, of course, real users aren't in their right mind, or rather they aren't in the *programmer's* mind.

So we have the famous *beta* test stage. This is where the programmers hand out their beloved creations to the whims of *real* users whose job it is to try out the software in the real world and hence find all those things the programmers and testers couldn't find.

Beta testers have problems too. The program has to be reasonably usable, otherwise they won't be able to get anywhere with it, but when an error *does* occur it's just not good enough to say: "It crashed", it's barely good enough to say: "It crashed when I clicked the Bubble icon" – the key feature of any bug report is *reproduceability*.

To be of any use to a programmer, a bug report must say: "Every time I do X then Y and then Z, it goes phut and dies." It then goes back to the programmer who tries X, Y and then Z and hopefully it goes Phut and dies.

If it doesn't the programmer has to try and duplicate all the other aspects of the computer the beta-tester was operating when it went Phut – even down to the desktop sillies and the fact that the tester was listening to his favourite music on the built-in CD drive.

There is a temptation, when faced with bug-finding, to say *it can't be that* with complete certainty, only to find out later that it was – I know I have. There is, naturally enough, a scale of probabilities about what the problem might be but nothing must be omitted.

When you consider that every time a new option is added to a program the number of different pathways through the code can be increased a hundred-fold, you can see that even beta-testing won't find anything in a program of even reasonable complexity.

So then you have the ill-defined testing phase called *gamma-testing* which consists of the final end-user who has paid for the software and expects it to work perfectly – after all, the Trade Descriptions laws permit him to assume that a program is suitable for the purpose for which it's been sold.

But there's a difference between suitability and perfection. One is attainable and the other isn't.

Steve Turnbull explores the vexed question of perfect programs

Steve Turnbull – Editor

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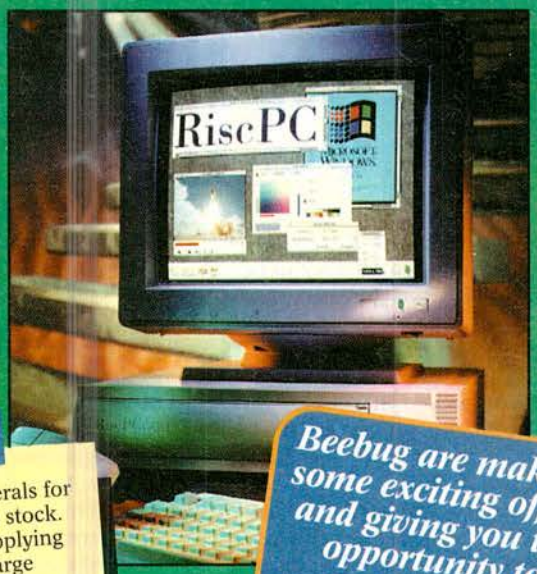

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Chaos on Sky

SPHERES of Chaos will be viewed – courtesy of Sky One's Games World – by six million people each week. The reason is that Matt Black's (0733 315439) game is the one chosen for the Fight Night Challenge. Five players compete in a head-to-head battle using a modified A3020 with five keypad controllers.

This Acorn game was selected by the show producers Hewland International as it was able to have five people playing, as well as having spectacular graphics and an easy-to-learn gameplay. The Challenge will be broadcast on Sky One throughout December and January.

First steps in data handling

APPIAN Way (091-373 1389) has a new data handling program for Key Stage 1 children called 1st Find it. This is entirely picture-based with children searching topic files of colourful pictures.

Based on its Find It package, you can choose from a number of data files such as Fairy Tales and Teddies on the program disk, opt for the additional topic files or create your own.

CD learning

ACADEMY Television (0532 461528) has launched two new interactive CD-Roms. Environment II: Land and Air is a follow-up to Water and looks at topical environmental issues like the changing climate, conservation and air quality and contains seven documentary-style videos. Also launched with this disk are Introduction to Climate Change, Conservations and Dwindling Resources which are introductory CD-Roms taking a complete section for the parent CD and come with an A4 brochure written by the International Centre for Conservation Education (ICCE).

Second is Science II: Materials which complements the previous Elements disk. It introduces over 150 materials in everyday use from cheese to chalk and gives a fundamental guide to science.

Acorn Computing open day

IF you are within travelling distance of Manchester on Sunday 4 December, come to the Portland Hotel where you can meet the *Acorn Computing* team as well as visit a host of software houses and hardware developers in the Acorn market.

One of these is Creative Curriculum Software who is bringing forward its release of its Maths Worksheet Generator called MathsGen to coincide with the Open Day. This new package allows you to print work and answer sheets for an infinite variety of questions concerning addition, subtraction, division and multiplications. The official launch is at BETT '95 but this is your only chance to see and buy this package before January.

These can be laid out as *fill in the boxes* or as the more standard question and answer form. The RRP is £12.95 plus VAT but there is a special launch price until the end of February of £9.95 + VAT. Included in the pack is a £10 voucher which will let you upgrade to Maths Card at a later date. This has increased facilities such as long division and multiplication, simple and complex fractions, metrication and much much more.

Artful additions

ABC Art (0278 751317) has released another three disks in its clip-art collection. These comprise detailed and professionally-produced ArtWorks drawings for £6 each disk.

Scrabbling to win

IN the August issue of *Acorn Computing* we asked you to test your word power, the winners receiving copies of Scrabble to enhance their finesse. The first out of the hat was P. Wheelhouse from East Grinstead who'll win copies of Scrabble, Junior Scrabble, Travel Scrabble and a Dictionary.

The runners up are: C. Singleton, Hazel Grove; T. Spicer, Swanland; J. Humphrey, Bournemouth; M. Richardson, Killamarsh; L. Brindle, Bolton; J. Fox, Gatley; C. Muddiman, Telford; I. Pritchard, Anglesey; S. Burke, Luton and S. Handley from Liskeard.

Tiles and trees

KUDLIAN Soft (01926 851147) has added two new products to its catalogue. RepTile is a tile manipulation package costing £30. Using draw objects for the square, hexagonal and triangular tiles means that these can be edited. This encourages mathematical concepts in tessalating and symmetry as well, as creativity in pattern design.

ReTreeval combines a database with a decision tree program. To search the database you ask a question in natural English and the amount of information stored grows with your needs as ReTreeval learns with you, so it always asks questions in an easily understood way.

Good news

COLIN Randall is the rector of Hanborough and Freeland and runs the Christian Acorn Users Group. He became an Acorn user two years ago, managing to persuade his parish to buy an A4000, hand scanner, Impression and an HP DeskJet printer.

He is producing a twice yearly Newsletter featuring items to help people use their Acorn machines and information on packages with a religious bias. If you want to know more write to: Rev CA Randall, The Rectory, Swan Lane, Long Hanborough, Witney OX8 8BT.

Video access

EXCLUSIVE for Risc PC owners is a new home video editing system from Eidos called Eidoscope. This package is based on its program for the professional non-linear video editing market. Eidoscope supports a range of tools such as an easy-to-use editing control panel, real-time edits, mix and wipes, full video/audio synchronisation control, simultaneous editing and mixing of two audio tracks, compatibility with other Acorn titling packages, imports sprite animations and exports single frames for use in story boards.

Furthermore, it edits at 12.5 frames per second with a resolution of 160x120 pixels with 32,000 colours with full screen playback facilities.

Drag and drop is featured both with video frames from the play to record window and when it comes to time codes. There is an active time line and an extra workspace window with multiple shuttle speeds and context-sensitive mouse operation.

Non-linear editing means that you can insert or cut video at any point and random access lets you re-order shots to make up any given sequence using cut and paste, while shots can be pulled from the source file to compile a first rough cut.

Eidoscope supports Acorn Replay so an edited movie can be used with other Acorn applications. All you need is a Risc PC, 4Mb of ram and an Eagle M2 card. Full details are available from Computer Concepts (01442 63933).

Acorns abroad

KAYAK Computer in Lyngby (010 45 93 6191) is Acorn's Danish distributor and director Henning Hanson has taken his ARM power to the sea. Wearing a Risc PC logo on his back, this experienced kayaker can be seen at sea around the Danish coast.

Meanwhile in Holland, ECD Computers' (010 31 7031 94343) expanding Acorn business has led it to new premises: Business Park Zuidflank, Patrijsweg 76, 2289 EX Rijswijk, Holland.

Slipping into the cybersurf

A NEW book has been produced by Koeksuster Publications (081-959 3321) to help those new to the principles of the Internet. Called the Internet Primer, it costs £10 and aims to introduce schools to Internet in lay terms.

There are instructions on how to connect to the Internet at minimum cost with guidance on planning and management.

Cover art

Missing from last month was a credit to Peter Clements for his cover artwork used in the film strip. Thanks Peter.

Pro OCR

VERSION 2 of Sleuth has been released by Beebug (0727 840303). The designers claim that recognition accuracy has been improved when combined with an interactive spelling checker and can achieve over 99 per cent on good quality images, as well as recognising normal, bold, italic and bold italic weights – without training – of virtually all the popular typefaces and sizes. Font styles such as bold can be previewed on screen and output as ascii or Rich Text Format.

In addition, the new version automatically converts complex pages of multi-column text and graphics and ignores the graphics. Alternatively, multiple zones can be drawn around the areas of an image and links used to specify the zone order. Areas of graphics can be enclosed in *ignore* zones and zones can be saved in template files and reused for similarly formatted documents.

Also new to Sleuth 2 is Guide Editing. The caret is moved to the next mistake and a magnified view of the original word in the image is displayed. Sleuth 2 can scan images directly using Twain drivers and costs £99, or £49 if you upgrade. The original version remains available for £59.

The other company in the running for *best OCR package* is Neurotron and its Optical professional software has also been under enhanced development. The two products have many similar features. A comparative review will appear in *Acorn Computing* soon.

Clan Acorn '94

ACORN World saw the creation of the Acorn Enthusiast's Scheme designed to bring together those who use, design and make Acorn computers. Special offers are available to members such as an Acorn Visa card and a chance to buy Acorn's C++ and new developer toolkit at a special price.

A lifetime's membership costs £15 and gives you access to offers and advance information, as well as a selection of promotional items. Acorn's Peter Bondar commented: "Clan Acorn '94 is the ultimate club for Acorn enthusiasts. Our aim is to offer this group a forum to participate in the latest news and discussions within the Acorn community. We know many of our users communicate already, but we felt that by developing Clan Acorn '94 it would provide them with more – great deals, early information and input on future Acorn developments."

Calling all BBCs

MARK Brocklehurst at The Beeb Supporters Group wants to hear from anyone using a BBC A, B, B+, Master, Compact or Electron. You can contact him at BSG, 1 Park Avenue, Markfield, Leicester LE67 9WA.

Tile time

OAK Solutions (0113 232 6992) has created VersaTile. This tiling package lets you produce tiles and manipulate them to explore tessellation, mathematical relationships, shape and colour, rotation, reflection and translational geometry. Simple and complex tiles can be used with curved and straight lines without the need for pre-defined grids, making this a powerful and open-ended tool.

VersaTile comes with a selection of tools which ensure that tiles fit together accurately. Once a tile has been created it can be copied and *snapped* to other tiles. Designs can be output to printers and plotters using the Draw Print and Plot utility or saved as draw files. The price is £45.

Flora not fauna

TREES of Britain is a new CD-Rom from Main Multimedia (0962 870680). Produced in association with the Tree Council, this package gives you information about the native species of tree and common introduced species.

Individual trees are listed by common and latin names or you can search on photographs of the different trees. There is an extensive photographic database so you can see the natural habitat as well as close-up views of fruit, flowers, twigs, leaves and seeds.

The accompanying text covers the general details as well as information on ancient and modern uses of each tree and any associated folklore and medicinal uses.

New plots for old

COYPU is a new package from The Shell Centre for Mathematical Education at Nottingham University (0115 951 4991). Designed for secondary school mathematics, it has powerful data plotting facilities such as: Plotting cartesian, polar and parametric functions, handling implicit functions directly, plotting data from CSV and SID files, applying functions to data fields as well as printing graphs and exporting them as draw files.

The cost of £60 or £40 if you are upgrading from Mouse Plotter.

A good book

EXPLAN (01822 613868) has created a multimedia Bible for the RISC OS machines. With texts from Canada, California, Germany, Russia and the UK, you can compare translations and cross-reference verses simply and quickly.

This is a modular package which – in addition to powerful search facilities – comes with a range of pictures and maps and the ability to directly export text into Impression.

The HolyBible Base Pack costs £70 and comes with the Authorised version and Strongs Concordance. Other modules are also available: New International Version (Anglicised), New Revised Stand Study Bible, Russian, and Revised English Bibles which is an educational pack including graphics and maps for £45. Also in development are the German Elberfelder and Luther bibles as well as Hebrew and Greek versions.

More laurels for Semerc

NORTHWEST Semerc has added another award to its collection with the Times Educational Supplement and National Association for Special Educational Needs Award for My World 2 – Dinosaurs.

The award was in the IT category for educational software which is accessible to a wide range of users. My World 2 – Dinosaurs is a joint project with Bury Local Education Authority and is a themed package aimed at primary pupils covering such topics as games, counting and archaeology. Children can assemble bones and even build their own dinosaurs.

Access time

THE recent Acorn World Show gave a variety of tasters of programs to help you in your negotiations with the superhighway. DoggySoft (0494 673222) was demonstrating both Termite and Termite Internet. Termite supports a new graphic interface system called OOGIE (Object Orientated Graphical Interface Emulation) so for the first time, Internet graphical screens can be seen in the RISC OS environment.

Xmodem and Ymodem are supported, as are SEAlink, Kermit and ascii. Termite conducts transfers in the background and supports multiple sessions. With Termite Internet this feature is exploited by providing multiple TCP/IP (Internet) sessions.

You can expand Termite with a set of IP facilities to access an Internet provider. This provides RISC OS users with an intuitive Internet interface. The FTP system is graphical and you can upgrade between Termite and Termite Internet for the difference in cost. Termite costs £49.95 and Termite Internet £79.95.

Acorn was showing a world-wide web browser in prototype form, but more advanced was Marcel from ANT (0223 567808), due for release in the Spring. Heralded as an easy-to-use multimedia e-mail package for RISC OS machines, Marcel complies with the MIME multimedia e-mail standard and can deal with any kind of data, from text and programs to graphics, sound and video.

A simplified version is available as Marcel Junior which is available for educational users. It retains all the usual sophisticated multimedia e-mail features but the interface is simplified and control over the exact configuration for each user can be determined when the software is installed. Work is also under way at ANT on a News Reader, WWW/Mosaic browser, FTP, Gopher and Archie filers.

Acorn and Big Blue

ACORN Computers has announced a partnership with Blue Micro, the exclusive manufacturer's representatives for IBM Microelectrics in the UK. As part of this relationship IBM will manufacture the new 486 PC card of the Acorn Risc PC range as its plant in Vimercate near Milan.

The card has been designed by Aleph One and specialist ASIC designers Future Technology Devices International and fits into the Risc PC's open bus enabling PC software to run without emulation. The card will be supplied with an off-the-shelf version of IBM's PC Dos including manual and drivers. Acorn will start shipping to *privileged customers* in December.

Two processor options are available – the 486DX33 and 486DX2-66. These provide a level of PC performance equivalent to dedicated PCs of a similar specification. Aleph One (01223 811679) will also provide a card without a CPU so that you can add your own 486 processor. The card will accept most processors but Aleph holds a definitive list.

Aleph One cites January for availability and the PC card will work with any Risc PC, though it recommends a minimum of 8Mb ram if you want to run Windows and that you upgrade your Vram. Depending on the PC software you intend to run, you may also need to upgrade your hard disk as PC applications are storage and memory hungry.

DUNE II™

One of the biggest games ever
now available on the Acorn

BATTLE FOR ARRAKIS

Speech - Artificial intelligenc - 9 mb compressed graphics - 30 massive battle zones - Based on the cult book by Frank Herbert - Over 20mb of source material squeezed onto 7 floppies.

ECLIPSE

Westwood STUDIOS

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Runs from floppy or HD on RISC OS 2/3 with 2mb RAM.
Available at £34.99 direct from ECLIPSE:-
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Tel: (01243) 531194 Fax: (01243) 531196
Also available from all good stockists

Spelling it out

NEW from Creative Curriculum Software (0635 297866) is Spelling Book for Key Stages 1 and 2. The package can be used to help children from the age of four with their learn spellings. Words can be input directly into any multitasking word processor or DTP package.

Dictionaries are simple to use and create and the teacher has the option of using a wide selection of supplied dictionaries. These range for the simplest of *basic* words to sets tailored to the common National Curriculum topic areas. New dictionaries can be easily created with children adding their own words at will.

There is also a quiz section which lets dictionaries be used as the basis of missing letter-type games. The teacher or parent can configure the software, including varying the letter size and disabling the add and delete options among others. The cost is £39.

Anytime and anywhere

OMNICLIENT is a new package from ANT (0223 567808) due for release in Spring '95 and allows a RISC OS machine to access files and printers on a wide range of different kinds of computers connected to an Ethernet network – Acorn, IBM PC, Macintosh and Unix network file servers and printers can all be accessed from the desktop through a single icon.

Irrespective of the type of file server or network protocol, OmniClient provides a simple and consistent view of the network services. This is a major breakthrough as networks of mixed computers are becoming increasingly common in all areas, from education to business.

Moreover, users don't need to know anything about how network resources are provided, they only need to know a name for the server of printer they need and access it via the mouse. Already supported are: Acorn AUN Level 4, Acorn Access, ANT RemoteFS, Sun Microsystems' NFS, Microsoft LAN Manager, Microsoft Windows for Workgroups, Microsoft Windows NT, IBM LAN server with the following optional support available for: Research Machines NetLM, Novell Netware, Novell Netware Lite, Personal Netware and Apple Ethertalk.

Label power

CIRCLE Software (0793 770021) has released LabelStar a printing application for all Acorn machines. With the ability to print plain text and graphics labels from the built-in address database, it only costs £49.50.

Sheets can be designed with any number of rows and columns, with you setting the spacing to match your labels with the results displayed on screen. Labels can be output as graphic or text depending on your printer. For instance, graphics labels can use any font and can include drawings and logos while text labels use straight text printing for fast output on dot matrix printers.n addition, professional quality graphics or charts can be embedded into DTPed documents and loaded back into Eureka with a mouse click.

On the artistic front, Revelation Image Pro has been extended to given more effects and a greater range of colours. Now with 24-bit graphics, there is a new level of sophistication with effects and transformations such as picture blending, colour shifting and lens simulation.

Improved sprite manipulation mixed with access to 16.7 million colour and 256 greyscale processing means that highly professional results can be achieved very simply. Revelation is priced at £49 with preferential rates for existing users.

Fortran graphics

FOR anyone interested in Fortran 77 Compiler, Intelligent Interfaces (01703 261514) has released the IGLib Fortran Graphics Library. This enables programmers to exploit the benefits of the high resolution colour display of the Risc PC. The cost is £25 and requires a II53 Fortran 77 Compiler or the II54 Fortran 77 Compiler Upgrade.

Technical Director, Andy Ray commented: "Our customers asked us how they could select screen modes and colours on the new Risc PC. We responded immediately by developing this library which provides all the routes they require. We have already used the library ourselves to update the Risc PC screen drivers for our implementation of the GINO-F Industry Standard Fortran Graphics Library."

Paper-less

PAPEROUT from Tools GmbH is to be distributed in the UK by Cumana (01483 503121). This package allows you to access information from Electronic Books. There are a range of titles in this format which are supplied as 8cm CD-Roms capable of storing 100m000 pages or text, 32,000 images or up to five hours of sound.

There are over 200 books in this format and more are being released to support the Sony Data Discman worldwide standard, and Cumana is distributing a range of these. The price of PaperOut is £49.95 and comes with a variety of search facilities and the copy and paste functions to let you use text in your own word processor or DTP package.

Acorn all-stars

PUPILS from five schools received awards for anti-drugs videos at Planet Hollywood. This was the culmination of the Acting for Health – Drugs, Smoking and Alcohol Misuse competition. This national contest was open to all schools and was run by the Department of Health and sponsored by Acorn Computers, with the awards presented by John Leslie.

During the competition, the 96 shortlisted schools went on a Superchoice Film Makers' Weekend where they were given professional advice on how to turn their storyboards into effective videos. The winners were divided into four categories: Key Stage 2, 3 and 4 plus a special category including ethnic languages, deaf and hearing impaired and special school entries. All the videos were premiered at Planet Hollywood

The winning schools were: St Chad's PC Primary School, County Durham; The Wyvern School, Eastleigh; Maltby Comprehensive School, Rotherham; Eavery School, London and Netherhall School in Cambridge. Each received a Risc PC and multimedia equipment.

Christmas comes

More seasonal specialities from Steve and Anne Bruntlett

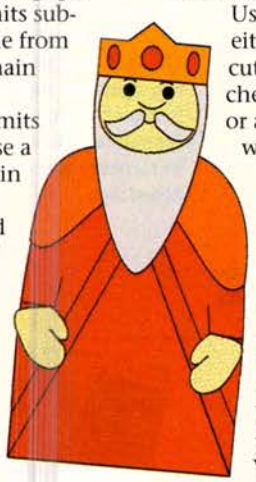
CHRISTMAS comes but once a year and it's probably just as well considering what a complicated and expensive time it can sometimes be. But fear not! Help is at hand in the form of this issue of *Acorn Computing* which will provide you with all the Advent bits and pieces you ever needed and even some you didn't think you needed, plus more box designs than you could stuff in a stocking.

In last year's article we looked mostly at the production of Christmas cards, boxes for presents and decorations for the tree. This year we intend to be much more three dimensional but will provide some clip art for all sorts of uses. Although there is some excellent Christmas clip art around, it is by nature two-dimensional, even if you apply it to something three dimensional like a box.

What we intend to do is provide three dimensional Advent bits and pieces that could either be used as they are or modified for your own purposes. These include a set of figures for a crib scene, a folded Santa Claus head, an advent calendar, a 'Twelve Days of Christmas' calendar and some assorted new box designs. All these resources for Advent are on the cover disk in colour, as well as in plain versions, so that they can be printed out and coloured.

Sourcing resources

The Advent resources are in Draw format and most of them are presented as A4 worksheets which include instructions so they can be printed, photocopied on to card and used by whole classes in schools. Please feel free to modify the figures, add to and develop them and rescale them if you need them in a particular size. To enlarge them from A4 to A3, change the paper size using the Paper Limits sub-menu which is accessible from the Misc menu in the main Draw menu.



Set the Show paper limits while you're at it and use a Magnify setting of 1.66 in the Transform menu. The worksheet will need a bit of repositioning. If it doesn't quite fit in your particular printer page size settings then reduce or enlarge it a bit at a time using the Transform option until it does. The boxes will fit together at any size because the enlargement or reduction is proportional, so you should have no worries that the sides won't meet when you try and stick them together.

Using the Nativity resources from the disk is fairly straightforward. There should be four versions of each of the sheets of figures; colour and plain versions, with and without construction slots. This is so that you can use the figures for a stand up Nativity scene or so you can use the unslotted versions as clip art on boxes, for Christmas tree decorations, gift tags or labels for home-made Christmas crackers.

The figures should be printed out on card or printed on paper and photocopied on to card. You need to cut two slits in the base of each figure and add a slotted strip of card bent into a D shape, with the curve at the front to make free standing models. Use a good craft knife with a new blade or go mad and buy a proper scalpel and blades from Boots for really accurate work. Use a steel rule for safety and either buy one of those green cutting boards, which are cheaper than they used to be, or at least a bit of thick card on which to cut.

Designs can be printed out in colour or can be added using your own paints, pens or crayons. You could try printing on gold or silver card if your printer will take it. We laser printed our cards last year on fairly heavy gold card which proved very effective. You could try adding highlights using a gold or silver pen, sequins or gummed shapes and glitter for the crown details. Small sweets could even be stuck on to the crown if your card was thick enough. We thought of suggesting real feathers for the Angel's wings but that's getting silly.

Ideas galore

Alternatively you could print out the individual figures quite large – one to an A4 page – and use PVA glue in a nozzle container to trace over the outlines. This should leave a raised surface when dry. Place thinner paper over the figure and use wax crayons to make a rubbing for a poster, or tree decorations using perhaps eight baubles on an A4 sheet.

Using metallic crayons that would be used for brass rubbing and black paper produces a very different and striking effect. They could also be wrapped in crumpled aluminium

but once a year

foil that has been straightened, the foil smoothed down round the details of the figures, the whole surface brushed with boot polish and polished with a duster. It may sound implausible but it looks extremely effective.

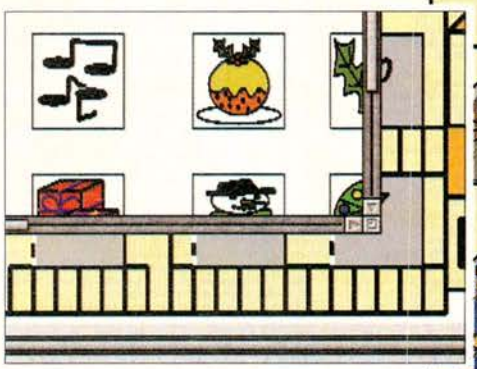
With a sheet of greaseproof paper over the printed figures the outline should still be visible so by using icing in an icing bag with a fine nozzle the outline could be traced. When set, more icing could be used, this time coloured, to fill in the outline, and the whole confection used on a Christmas cake which could have designs piped on directly if you feel confident. The figures could be used to produce card stencils with which to cut biscuits and, using coloured icing with ready-made icing gel for the details, complete the effect. We appreciate, however, that garishly-coloured Mary and Joseph biscuits may not be everyone's cup of tea.

Moving into other media

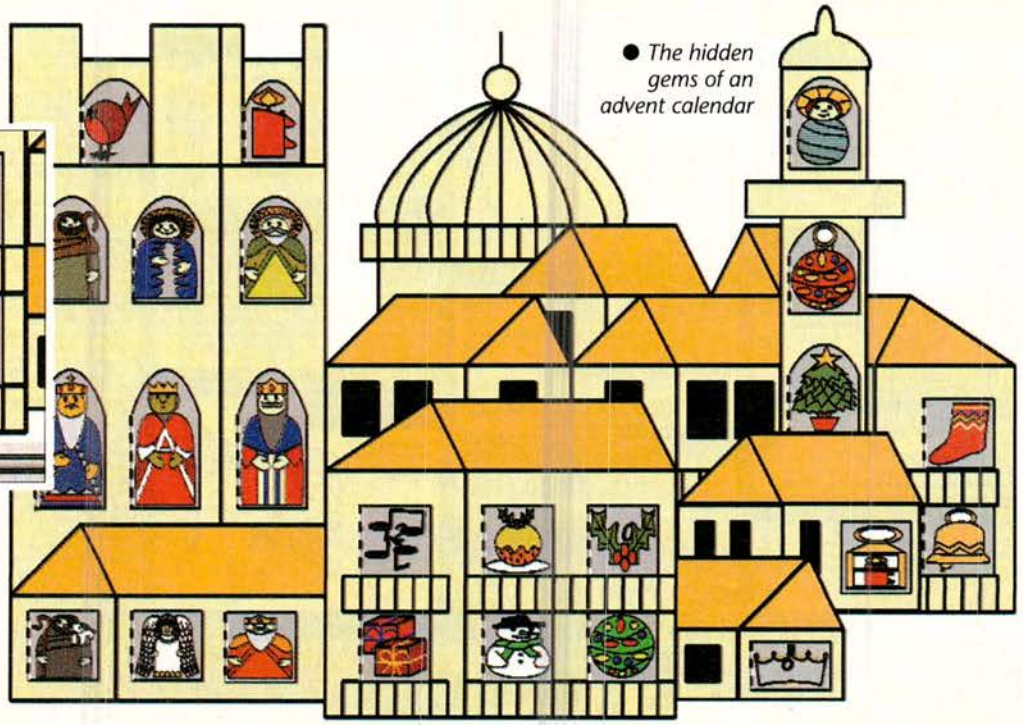
The figures could also be used as a basis for simple printmaking and textiles work. Use a large line width for the whole figure or group of figures, iron the printout on to lino and use as the basis of a lino cut. Reverse the design on screen before you print if you want the final figure to appear as it dies on the original drawing and especially if there is any text required.

Print out the figures, allowing 1cm all round on transfer paper, cut out the shapes in fabric and make into finger puppets or print them out larger and make them into glove puppets – always useful in primary schools! Alternatively, iron on to fabric, use textile paints to complete the figures, sew round the edges and stuff with kapok for soft sculpture Nativity figures. The Nativity figures could be used as patterns from which to cut out felt shapes for collage work and if you have a copy of Clare's Card Shop use the translator to utilise the clip-art in the program for Christmas cards.

The figures could be ironed onto thin plywood or MDF, cut out with a coping saw, sanded and painted with a hole at the top to make Christmas tree decorations. If a large line width was used for the whole figure or group of figures then they could be printed out on to acetate and the shapes coloured using overhead transparency pens to ➤



● *Lining up the parts of your advent calendar*



● *The hidden gems of an advent calendar*

Showroom open Mon-Sat 10-18.00 hrs (All prices exclude VAT) Carriage included except where indicated

CD-ROM

All the following CD-ROM drives are PhotoCD compatible (multi-session) and include a driver for CDFS ⇒2.20

Internal Drives

XM-3401B (Caddy) 200ms, 330kb/s £250
XM-3501B (Caddy) 200ms, 600kb/s £375
Suitable for RiscPC. SCSI interface not included.

Fantastic Value External SCSI CD-ROM Drives (for all machines)

Panasonic (Tray) 300ms, 300kb/s £229
XM-3401B (Caddy) 200ms, 330kb/s £325
XM-3501B (Caddy) 200ms, 600kb/s £450
SCSI interface not included. Add extra £25 for A3000.

SCSI cards

Morley uncached SCSI card £130
Morley cached SCSI card £170
Cumana SCSI II card £200
The above cards are suitable for A300, A400, A3000 (Ext), A540, A5000 and RiscPC. For others see MultiPodules.

Hard Discs

A5000/RiscPC 2nd Internal Drive

210Mb IDE 14ms Cache (~1Mb/s) £149
420Mb IDE 14ms Cache (~1.5Mb/s) £199
540Mb IDE 12ms Cache (~1.5Mb/s) £279
The above include all cables, screws and instructions. All the above drives are Connor as used in the RiscPC

A300/A400 Series Internal (IDE)

210Mb 14ms Cache (~1Mb/s) £229
420Mb 14ms Cache (~1.5Mb/s) £279
540Mb 12ms Cache (~1.5Mb/s) £359
The above include all cables, screws and instructions. Add £79 for ext case and/or £25 for A3000 podule case. **All the above drives are Connor as used in the RiscPC**

Syquest Drives

IDE 105Mb Internal for A5000/RiscPC £159
(Above Includes one cartridge, cables & driver software)
SCSI 105Mb External for all Machines £199
(Above Includes one cartridge, exclude SCSI card)
105Mb Syquest Cartridges £45

TopicArt

Single disc clipart containing approx. 50 high quality draw format clip art images, each on a single subject. Comes with mono reference sheet. 12 subjects are available now. Please specify when ordering. Site licences are £16+VAT per disc, please ring for further details.

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Subjects avail.
1 - General
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8 - Sports Figures
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10 - Symbols
11 - Tools
12 - AnimalsGB

£8 + VAT per disc

TopicArt catalogue now available. £1.50 Inc VAT & p+p (cheques only)

Buy 4 TopicArt discs get one free
not incl SpecialArt

TopicArt12 - AnimalsGB

TopicArt4 Entertainment

QuickTile v1.02 £25+VAT

Up until now it has only been possible to print posters from Draw & Sprite files. Now with QuickTile you can create posters from ANY RISCOS application, including Impression. Simply enter the size of poster required & select PRINT from the application! QuickTile does the rest, printing each tile with crop marks and tile references. RiscPC compatible.
Requires RISCOS 3.10 or later.
Return Disc with SAE for upgrade.
Upgrade from Tiler for £15+VAT.

DIY Ink Jet Refills

Single Refills (req an orig cartr.) £7
Twin Refills (Black only) £12
125ml / 400ml Cleaning Kit £4 / £10
Available in Black, Cyan, Magenta, Yellow, Red, Green, Blue, Brown
Please specify colour(s) required when ordering.These do-it-yourself refills can be used with any printer where the head and ink reservoir are combined, ie, DJ-500, BJ10/200. Please do not send empty cartridges. Please note that colour quality may not be 100% from a black cartridge refilled with another colour. We cannot guarantee against dried up empty cartridges and/or blocked nozzles.

QuickSound £10

Load, play, convert & resave Armadeus, Tracker and raw data sound samples. Apply special effects including Reverse, Echo, Max Vol, alter replay rate and resample frequency. Convert samples into modules for use with the RISCOS sound system. Create stand alone Utility mod's.

QuickShow £25

Slide show presentation and video titling package. Create sequences of frames containing text of any colour with drop shadows, outline shadows and rubout boxes using the RISCOS fonts. Sprites can also be included in frames, positioned and resized as necessary. Screens can be linked together with the sequencer with fades in and out.

SpecialArt (Xmas or Signs) £20+VAT (each)

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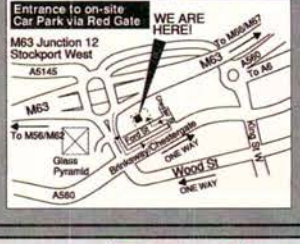

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Spec !

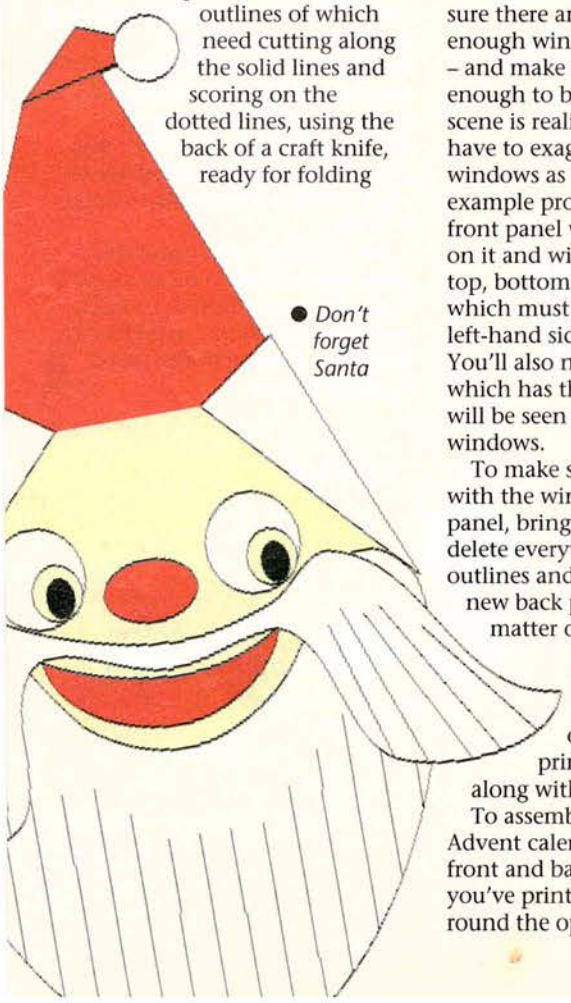
make a stained glass window.

For a different kind of stained glass window use simple, heavy outline shapes. Cut out two of each figure, then cut out the bits between the lines and sandwich coloured net, tissue paper or cellophane between them by either gluing the backs of the figure-outline shapes or by stapling, perhaps adding sequins or gold or silver braid and then hang them up on the tree or in a window for maximum effect.

The figures could also be printed on a strip of paper of a size that can be wrapped round a toilet roll inner to make free standing figures. We'll try working on some ideas for more three dimensional figures for next year, but for the time being we hope the ones provided give you some scope for Christmas creativity.

The advent calendar

The Advent calendar has one front panel, the window outlines of which need cutting along the solid lines and scoring on the dotted lines, using the back of a craft knife, ready for folding back when they need to be opened. Please don't cut on the dotted lines unless you want your windows to fall out.



● *Don't forget Santa*

The Advent calendar back panel presented here has simple motifs which we produced very quickly, hopefully illustrating how effective simple designs are if you use a limited range of techniques such as thick lines, simple shapes and two or three colours. You can use the professionally produced Christmas clip art such as the samples provided by PES – which can be found on the cover disk – or alternatively use another collection of Christmas clip art, preferably your own! The Advent calendar is only A4 in size which is perhaps a bit small, so enlarge it to A3 using the instructions above or photocopy it onto A3 card.

To produce your own Advent calendar make sure there are enough windows – 24 – and make them big enough to be useful. If your scene is realistic then you may have to exaggerate the size of the windows as we've done in the example provided. You'll need a front panel which has the design on it and window outlines on the top, bottom and right-hand side which must be cut, and on the left-hand side to score and fold. You'll also need a back panel which has the images on it that will be seen through the windows.

To make sure the images line up with the windows, save the front panel, bring up a copy on screen, delete everything but the window outlines and save the outlines as the new back panel. Then it's just a matter of dropping the clip art, or preferably your own original drawings, into the outline boxes and printing it out on card, along with the front panel.

To assemble the resulting Advent calendar, spray-mount the front and back panels on to card if you've printed on to paper. Cut round the opening bits of the windows and use glue, or preferably double-sided tape, around each of the images and the outer edges of the back panel, then carefully press the front panel into position, trimming the whole calendar round the edge if the two don't line up exactly. If you haven't scored the left-hand edges of the windows you can still do this at this stage.

● *The two parts of the twelve days of Christmas wheel*

Twelve days of...

The Twelve Days of Christmas Tree needs one of those brass paper fasteners – the ones that you can never find when you want one – stuck through the centre of the tree and the revolving back panel so that you can rotate the pictures and see them in turn through the wedge shaped window.

The images in this piece of Advent work were provided by PES, though you'll need to buy the Christmas Clip Art Disks if you

Sources

Christmas Secular & Christmas Religious Image disks cost £9.50 plus VAT and are available from: PES, 72 Kimberley Road, Leicester LE2 1LF, Tel 0533 733063.

There is a 10 per cent discount for purchases of four or more disks. Postage and packing costs £1.50 for up to 10 disks and £3 over 10 disks.

want all 12 days. If you want to produce your own version simply drop your own images on to the blank version and reduce and move them to fit the apertures. This is perhaps more complicated than it sounds because of the funny shaped window and the fact that they seem to need to be rotated by differing degrees because of the placement round the edge of the circle.

The easiest way to place clip-art on to the wheel is to put the first piece of clip art in the top wedge-shaped aperture, group it with the wheel, rotate the whole lot by 30 degrees and put the next piece of clip art in place in the next blank space which should now be at the top of the circle. It's easier than it sounds, honestly.

Ten of the Twelve Days of Christmas images are provided in their standard orientation on the cover disk and can be used as normal clip-art for a wide variety of purposes. The pear and leaves could be lifted from the Twelve Days of Christmas Tree and used to decorate place setting labels for Christmas dinner or even for place mats. There's an example place mat on the cover disk, but it should be relatively straight-forward to produce your own from a tasteful selection of Christmas clip art.

A cacophony of alternatives

There are instructions for the Santa Claus contained on the work sheet, so all you need to do is print it out, score and fold along the creases indicated, stick down the beard bits and complete with a small blob of cotton wool and a hole in the top so the whole assembly can be hung on a Christmas tree using a bit of ribbon.

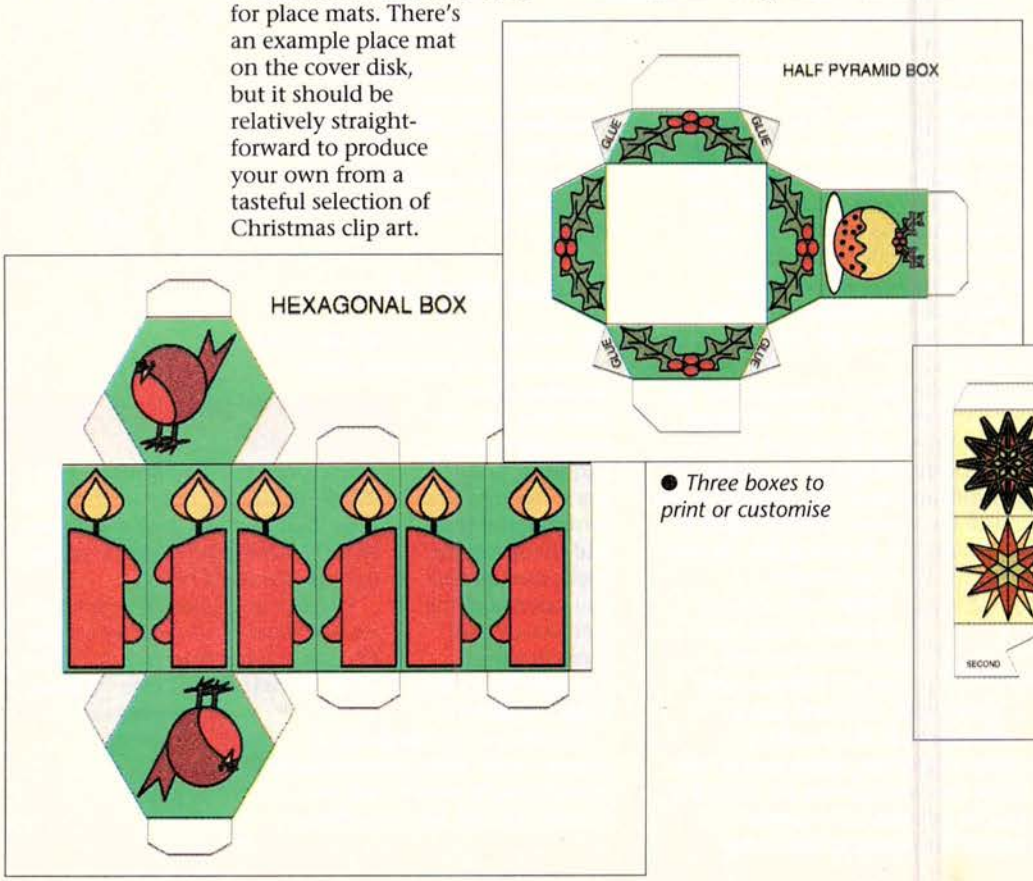
The boxes are straightforward. They need printing out or photocopying on to card – coloured card if you like – cutting out, scoring along the folds and assembling using either glue, a glue stick or preferably double-sided tape. When you're scoring the folds or tabs, make sure you turn your knife blade over otherwise you'll cut them off. Don't say we didn't warn you!

The simpler box nets can be used to make small boxes which can be hung on a Christmas tree-shaped card or the Christmas tree itself, and contain a chocolate for each of the days of Advent leading up to Christmas. Boxes of any size can have clip art added to them before printing out.

For example, if you wanted to put some of the stars which are provided on the cover disk on to one of the boxes, simply load up the box net, select the star, go to the Save menu, use the Selection option and drag the Draw icon of the star drawing to the bottom-left of the box net sheet and let go. Click on the box net sheet, select the star, drop it into the bottom left-hand corner of your box drawing and move it into position, changing the size and orientation to fit the box face and adding colour if you want to liven it up a bit.

If you can't find it then change your paper size to A3, locate the errant star, move it into position and change the paper size back to A4. As we've said before, drawing stars is a doddle. Use the hexagonal grid and grid lock to draw stars or snowflakes. Use a very thick line for the star or snowflake shape, copy it and reduce the line shape in thickness, change the colour and place it over the original shape or slightly offset it for a whole variety of effects.

We hope the article gives you some ideas which you can use and hopefully inspiration to produce your own variations, or preferably, your own original design work. Happy Christmas!



● *Three boxes to print or customise*

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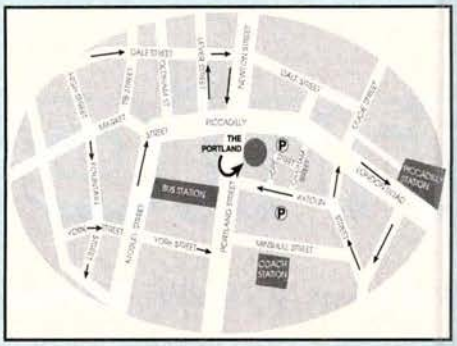

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The Christmas spirit

Bruce Goatly prepares for a seasonal occasion

WITH the Advent season now upon us, the time for carol singing is nearly at hand. So this month's project is a simple carol sheet for use at a Christmas *Lessons and Carols Service*. I'll be using the new TextEase presentation software as an example, and you can too – a demo version is on this month's cover disks.

First, the planning: You'll need some lessons to be interspersed with carols. You could always use the set of nine used by King's College Cambridge, but I've opted for the seven used last year by Westminster Abbey. For one thing, it cuts down on the number of hymns to fit on to the sheet.

Next, I chose a set of carols that broadly paralleled the subjects of the lessons. The first, *Once in Royal David's City*, is often used as a processional just to get everyone in place, and can also act to *gather* the congregation by starting from a solo voice, usually a treble.

Designing the sheet

First, let's look at how the sheet will be prepared and set up the basic document. The most convenient size is an A4 sheet folded in the middle to make a four-page A5 leaflet. To set this up in TextEase you just open a window and use the *Looks* dialogue from the main menu to choose the paper size and orientation – A4, with the width longer than the height.

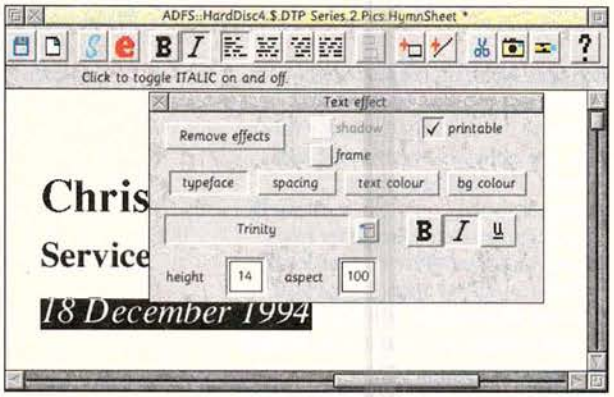
You'll need to create two A4 pages, one for pages one and four, and one for pages two and three, To do this properly it's necessary to have your printer driver loaded so that TextEase can detect the printable page area. After clicking on the button with an eye on it – the other way of reaching the *Looks* dialogue – make sure that the Printer limits option is ticked.

Then, so that you have the second A4 page ready for text entry, scroll down to the bottom of the page, click to place the caret at the foot of the page and press Return several times. This forces TextEase to create a new page. If you find that you only get crosshairs and a line to denote the second page, you need to go to the *Print* dialogue – pressing Print is the quickest way – and turn off the Figure option.

You'll probably find it helpful to draw a line dividing each A4 page in half, to help you visualize each leaflet page on screen. First, ensure that the Coordinates option is ticked in the *Looks* dialogue, then click on the *Line* button.

Move the crosshairs to position 148,0, click to start drawing the line, hold down Shift while moving to 148,420 and click again. Lastly, select the line by clicking on it and untick Printable in the *Graphics effect* dialogue – this leaves it showing on screen but stops it from being printed out.

● *Applying text attributes to a heading*



Typing the text

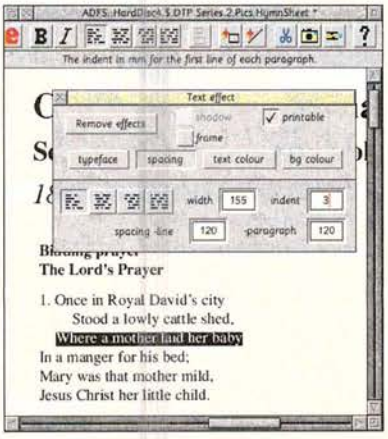
You're now ready to start typing. Just click where you want the text to begin and type in the headings. I simply used the name of the church, the service name and the date, but the wording is up to you.

The different appearances of type are applied to selected regions through the *Text effect* dialogue, which you can call up with the red *e* button. All you're likely to need here is available in the Typeface section – bold or italic type, and various sizes. I used ordinary Trinity, in 18 point bold, 14 point bold and 14 point italic for a bit of variety.

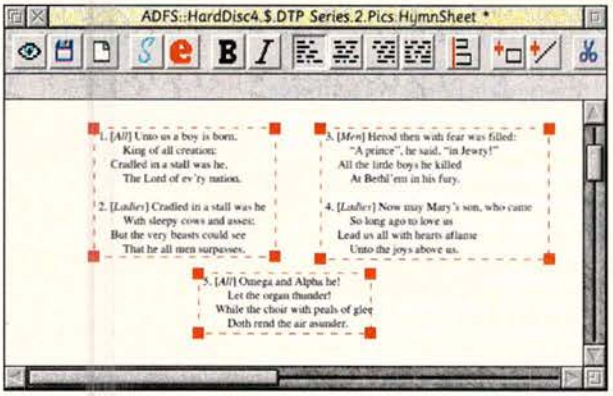
For the main text I set the type size to 8 points, as this was the largest size that would allow both of the longish first two carols to fit on page one. To get the feel of the way the software works, try typing in just one verse, then set up the indents as follows:

- 0mm for line 1
- 6mm for lines 2 and 4
- 3mm for lines 3, 5 and 6

The best way of applying the indents is to bring up the *Text effect*



● *Indenting the typed-in text*


ADFS::HardDisc4.$.DTP Series.2.Pics.HymnSheet *
1. [All] Unto us a boy is born.
King of all creation:
Cradled in a stall was he.
The Lord of ev'ry nation.
2. [Ladies] Cradled in a stall was he
With sleepy cows and asses:
But the very beasts could see
That he all men surpasses.
3. [Men] Herod then with fear was filled:
"A prince", he said, "in Jewry!"
All the little boys he killed
At Bethl'em in his fury.
4. [Ladies] Now may Mary's son, who came
So long ago to love us
Lead us all with hearts aflame
Unto the joys above us.
5. [All] Omega and Alpha he!
Let the organ thunder!
While the choir with peals of glee
Doth rend the air asunder.

● *Arranging verses into columns*

➤

dialogue with Spacing selected, highlight each line in turn by dragging, click in the Indent window, alter the value as needed and press Return. The dialogue doesn't disappear until you close it yourself, so you can switch repeatedly from text to dialogue quite conveniently.

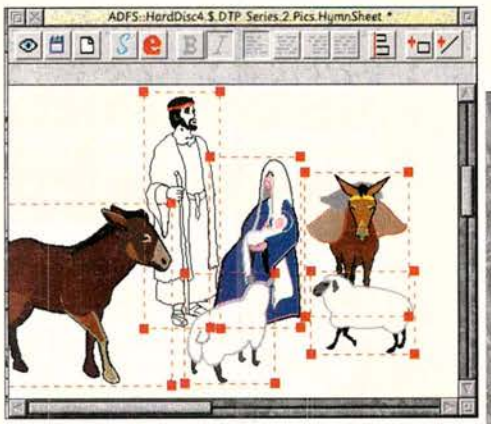
You can either start the second column of verses by placing the caret roughly where you want it to be and carrying on typing, or you can type the whole carol in one column and rearrange the verses afterwards. All it takes is cutting the selected verse to the clipboard with Control+X and pasting it back with Control+V.

You can always tidy up the positioning later, as well as applying bold and italic effects. A good way of ensuring that columns line up vertically and horizontally is to use the *Layout* dialogue, reached from the button to the right of the justification buttons.

For the best appearance, you may want to take special care over some of the odd characters by using the Alt key with the keypad numbers:

- 145 gives apostrophe
- 148 gives opening double quote
- 149 gives closing double quote
- 151 gives a dash for use between verse numbers,
- 232 gives *e-grave*, è (under RISC OS 3, è is also provided by Alt+] followed by e)

Once you've completed and arranged the carols neatly you can see how much space you have for graphics to add visual interest to the finished sheet.



● *The Nativity scene's various elements in place*

Adding the pictures

The pictures on page four were taken from clipart by Sherston Software (01666 840433). Importing a graphic into TextEase is done by dropping the file on to the page. Clicking on the picture brings up a resizable dotted outline.

If you're going to use the same pictures, split up the sheep and donkeys into individual files, then place them and Joseph tastefully around the picture of Mary and Child. Position the infant Jesus centrally on the page width and generally make him the focus by having everything else facing inwards.

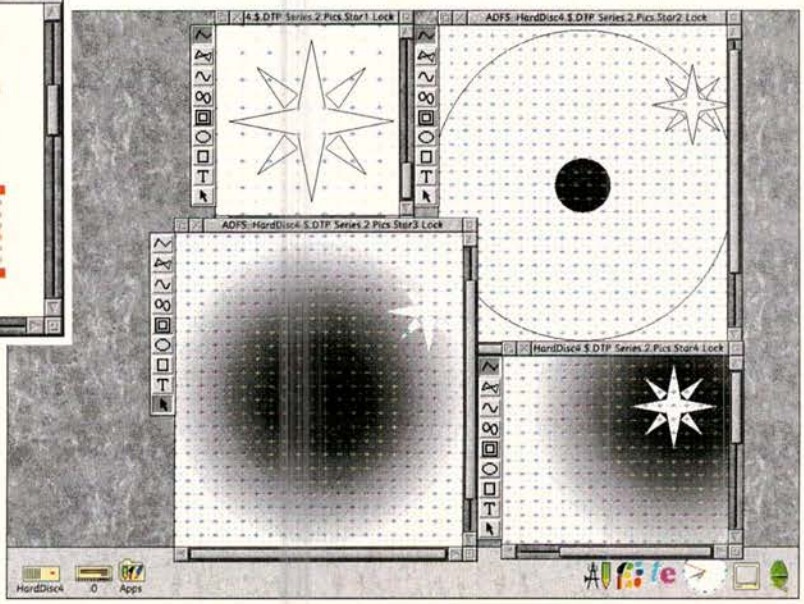
Once the pieces are in roughly the right places, getting their proportions reasonably correct is largely a matter of trial and error. You can sort out the various layers with Ctrl+H to bring a graphic up a level and Ctrl+L to push it down.

The star on page one is one I prepared earlier, with Draw under RISC OS 3. The different stages in its drawing are shown alongside. Use grid lock to make sure that the points of the star are regular and equal.

The two circles are filled in black and white respectively, and just before grouping them set their line colours to None. Then it's just a matter of using Grade with 64 steps, bringing the star to the front, setting the star's line colour to None and moving it to the centre of the black area.

There are two main things to remember about positioning the star on page one. The first is to allow for the non-printing area round the edge of the page, and the second is to avoid putting it behind any of the words, which would make them hard to read.

There are a few other things you can do, depending on how much space you have. For instance, you could add the emblem for the church on the first page or put the star on one of the other pages too. You could also prepare some large-print versions on A4 paper for those unable to read the small type.



● *Stages in preparing the star picture*

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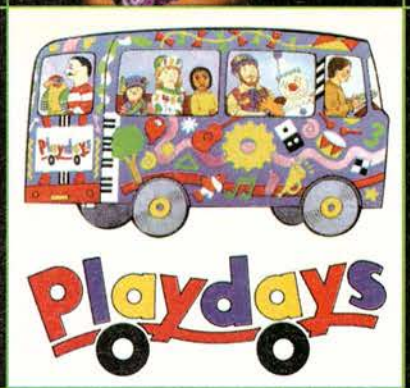

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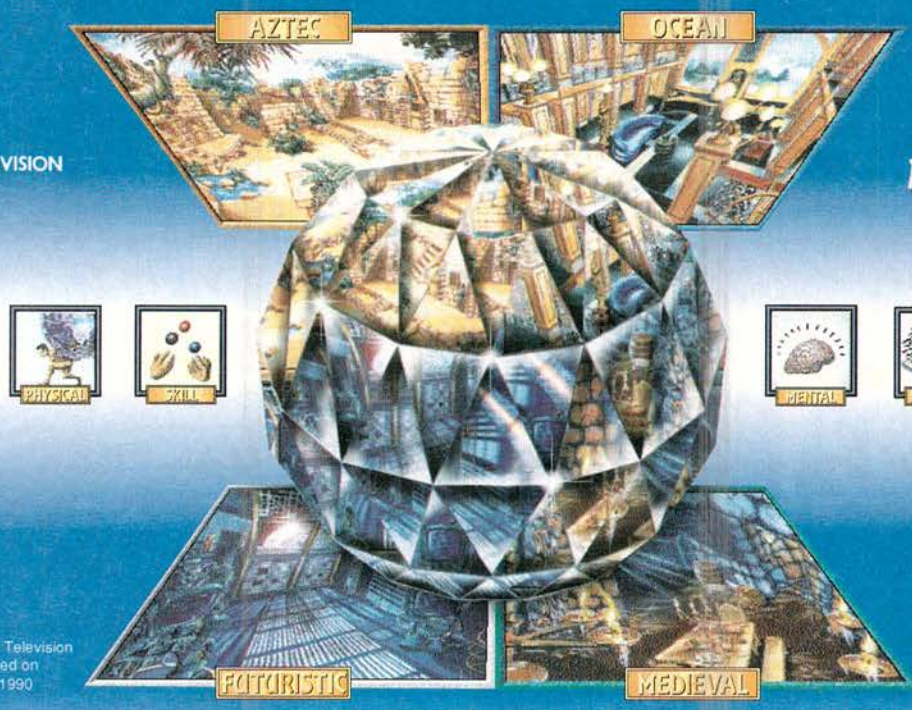

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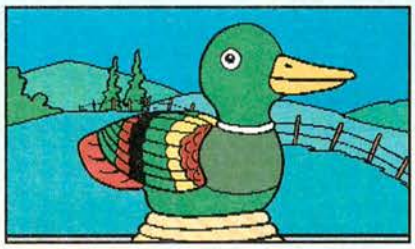

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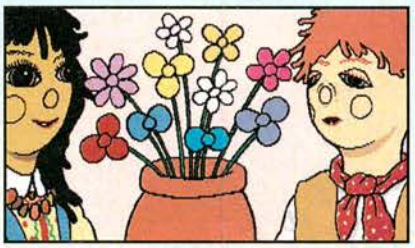

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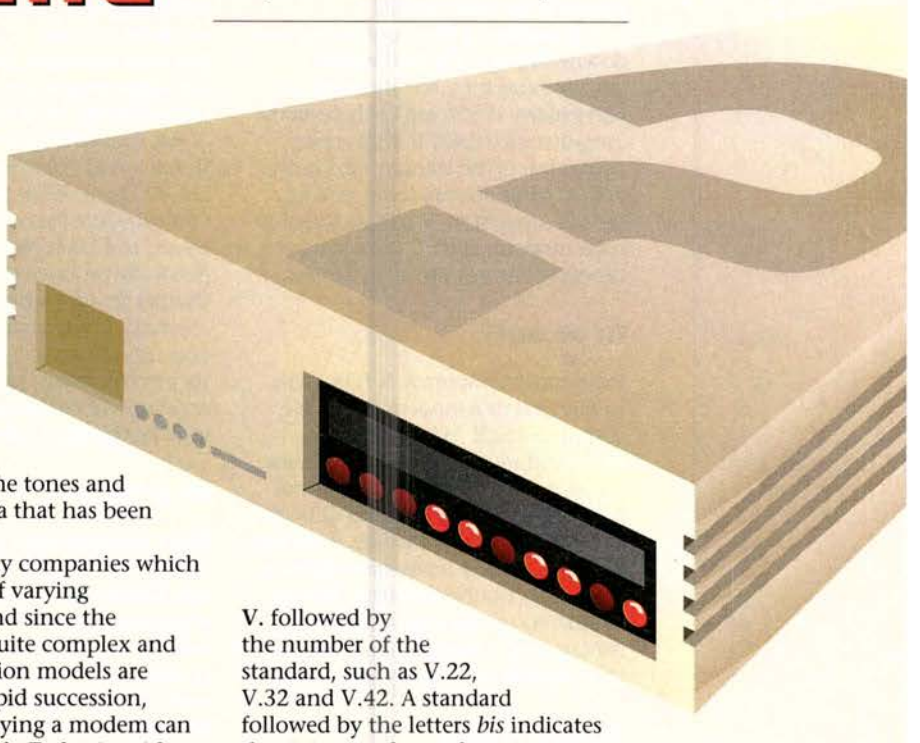
Choosing and using a modem

Confused about communications jargon? Rajesh Sinha explains



MANY of you will be eager to explore the thriving digital world of bulletin boards and other online computer services with an Acorn machine. There are plenty of sources of interest for newshounds, culture vultures and technocrats alike, but even if your interest is more obscure, there is sure to be some like-minded group of individuals which frequent the digital underground and would welcome your call.

Before you can begin to explore the realms of Cyberspace, however, you need to buy a modem. The word *modem* is a hybrid of the words Modulation and Demodulation, as these are the two main processes which are carried out when computers communicate over telephone lines.

Modems are communications devices which convert (modulate) the data signals from computers into audible tones which can be transmitted like speech and received by another computer. The other computer must then use a modem to demodulate the tones and interpret the data that has been sent.

There are many companies which make modems of varying specifications, and since the terminology is quite complex and higher specification models are introduced in rapid succession, choosing and buying a modem can be a daunting task. To begin with, it's probably best to decide what you're likely to use it for, and how much you can afford to pay.

The cost of modems is generally related to the maximum transmission speed possible. This speed is also referred to as the *baud rate* or *bits per second* (bps), with the most common speeds being 1200, 2400, 9600 and 14400 bps.

Universal error detection standards are also indications of a modem's performance, and the more standards supported by a particular modem, the higher the price is likely to be.

These standards or *protocols* are indicated by manufacturers using a V. followed by the number of the standard, such as V.22, V.32 and V.42. A standard followed by the letters *bis* indicates that it is an enhanced version, so V.22bis is a later version of V.22. These standards are set by the international communications committee ITU-T, and are a better guide to a modem's capabilities than the best speeds advertised by manufacturers.

The better the error correction, the less likely you are to receive corrupted data due to a bad telephone connection or other problems. The higher the modem's speed, the faster data can be sent, so phone bills – and hassle – can be kept to a minimum.

If sending, receiving and reading messages and *mail* from other computer users is likely to be your main reason for going on-line, a slow modem (upwards of 2,400 bps) will be adequate.

A modem of this sort is relatively cheap – under £100 – but will allow you to participate in *real-time* conversations and the reading of text. These modems are also useful if you intend to spend a lot of time searching databases, since the time-lag here is generally not due to a slow modem, but rather the other computer searching for particular information.

Transmitting larger files takes ➤

Need to know

- The organisation which determines international communications protocol was until recently known as CCITT (Comitè Consultatif International Tèlègraphic et Tèlèphonique) but now has the acronym IUT-T. This acronym has therefore been used in the article.
- The terms *baud* and *bits per second* are not technically identical, but are generally regarded as being similar enough to interchange their meanings. To avoid confusion, the difference between the terms has been ignored.
- We spoke to BABT and BT regarding non-BABT approved equipment being used on public telephone networks and have been told that BT can sue users of such equipment in the case of damage caused, and that it is illegal to attach non-BABT approved equipment to BT lines – BABT (0932 222289).

a long time with a 2400bps modem, so 9600bps or 14400bps is the minimum required to prevent considerable pauses and extortionate phone bills!

If transferring files (uploading and downloading), it is well worth paying extra for a fast modem, particularly if you are likely to make long-distance calls. V.42bis error correction is the standard for most 9600/14400 bps modems, and as data compression is also included in such modems, savings in terms of time and money are even greater.

In or out?

With most computers, it is possible to buy and fit a modem inside the computer itself. While this saves space and removes the requirement for an extra power supply, internal modems can often be more difficult to install and harder to use. External modems usually have status lights to allow easy troubleshooting, and are simpler to service and set up. They usually cost a few pounds more, but this expense is certainly worthwhile.

Sound bytes

Most of today's modems come with in-built speakers to allow you to hear tone dialling and other data transmission. While the speakers themselves generally offer poor quality sound, this facility is nevertheless invaluable for determining the causes of dialling problems and other transmission errors.

Check your fax

Modems are now available which send and receive fax data, so wordprocessed documents and other files can be sent to anyone with a fax machine or fax modem. Fax modems act just like data modems, but can allow you to send faxes, receive them, or do both.

Fax modems tend to have Group III fax speed (9600 bps) or Group II (14,400 bps). With these modems you can store faxes to disk and print them, and faxes sent by you will generally produce cleaner and sharper images when they are received. If you send or receive faxes and would like to avoid the inconvenience of paper snarls and shortages at crucial moments, this may be the ideal solution.

In a haze?

Most modems today are Hayes compatible. Hayes is a major modem manufacturer whose command set is now the standard worldwide. All good communications packages recognise and use the Hayes commands, so virtually any modem will work in conjunction with communications software such as ArcTerm or Hearsay.

When buying a modem, remember to purchase an RS-232 cable to connect your computer and modem together, and ensure that your computer is near to a telephone socket.

Final approval

There are a wide variety of low-priced modems available today which have many of the features listed above but are not BABT approved. Due to the cost of seeking BABT approval for modems, many manufacturers are selling products without the blessing of BABT. By buying and connecting such a modem to the telephone network, you could cause problems in your area and incur the wrath of the telephone companies. Be warned!

If you intend to use your modem to answer calls, you must ensure that the modem has an auto-answer facility. You may also need to have the option of switching from tone to pulse dialing if you are close to an older telephone exchange. A reasonable warranty and support – preferably on-line – are also prerequisites to buying.

Overall, buying the best modem you can afford will save you money in terms of phone and on-line charges as you use it. Once it's connected and working, you can begin your cruise on the information highway.

Get connected

If your modem manufacturer or communications software house has a bulletin board service in operation, it would be wise to make this your first port of call. Not only can you be sure that it is free of charge, but you are likely to find technical information, on-line help and advice, and news about future products and services which may be of interest. You will also be able to vent your frustration about any problems you have had.

Another possibility is a bulletin board primarily for Acorn users, such as Arcade or The World of Cryton. Here you can talk to other users, read messages, download files, play games and find new telephone numbers to try. Until next time, happy surfin'!

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The ITU-T (CCITT) International Communications Standards

V.22	2400 bps	
V.32	9600 bps	(V.32 modems can drop down to lower speeds in case of line interference)
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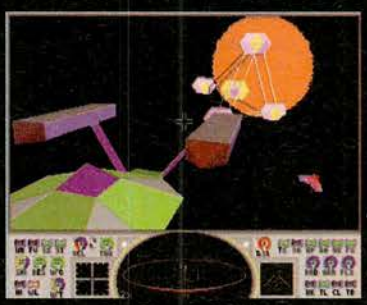

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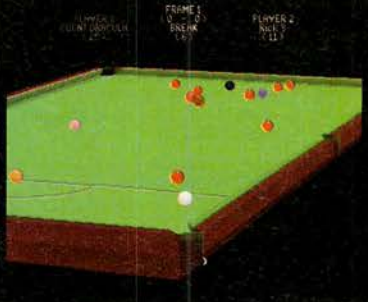

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Countdown

Acorns in the field

Steve Turnbull reports on using networked Acorn machines in a rather unusual environment

THE Lorien Trust is a charitable organisation that runs a very large fantasy live role-playing event once a year and, as one of its directors, I provide much of the computer support, in the form of Acorn computers, of course.

Over the August Bank Holiday of 1994, the Gathering was run at a private estate near Derby and once again machines were needed to provide facilities for administrative functions of all types. This time I decided that we would network the machines together, so I called on Acorn itself as well as several Acorn companies for help.

The Gathering is an outdoor camping event but we didn't, as in previous years, require the machines to be sited under canvas. And the power supply was not questionable so no UPS (uninterruptable power supply) was needed.

What was needed from the computers was the production of a newsletter for the 2,500 attendees, and for this to be done on, at least, a daily basis, although more frequently if possible. The machines also kept records of all the players at the event, and although the information was supplied in advance there were likely to be several hundred people paying on the door and these had to be catered for as well.

As it turned out, the Acorn computer system also ended up producing new Security badges which included the picture of the security officer.

We had just four machines, a 5Mb Risc PC, a standard 4Mb A5000, an A5000 with lots of hard disk space but only 2Mb of ram and an A420 with ARM3/RISC OS 3 but only 20Mb hard disk. From Acorn we borrowed four thin-ethernet cards with Acorn Access (and leads) to link them all together. Printing was available from an ageing LaserJet-compatible printer.

Acorn recommended that we try out the hardware connections and get the system running before we went to site. This turned out to be very good advice – there's a big difference between setting up a system when you're close to a phone and several days from an event, and trusting that everything will work first time when you're miles from help.

With Acorn Access you don't need a file server and can just make the hard disks from each machine available to all the others using the *Share* option that becomes available on the hard disk icon menu. Likewise, printing can be shared across the Access network without a specialised printer server.

From Computer Concepts we acquired network versions of ArtWorks and Impression Publisher plus an Eagle M2 card – this gave us our DTP facilities. From Cambridgeshire Software House we borrowed a Canon Ion still-video camera and one of my helpers provided his very own ScanLight

● *Hi tech meets low tech*

hand-scanner.

Given the rather strange set of resources, I decided to make the 2Mb A5000 equivalent to a file and printer server – its enormous hard disk facilities could store the vast number of fonts we had plus any digitised pictures and scans, all the text files and finished Impression documents. With the shared printer driver and the networking software loaded it had barely enough room in its 2Mb for anything else, so its keyboard was tucked out of the way.

The A420 was allocated as the text preparation machine, as its memory was insufficient to do any picture manipulation. The 4Mb A5000 was given the Eagle M2 card and became the layout machine.

The Risc PC was running S-Base 2 with all the player information, although it could be pressed into service for layouts if needed. As it turned out it never was.

Preparing the machines

Setting up the hardware in the machines proved to be fairly simple, just a matter of plugging in the cards and connecting the leads between them – ensuring that terminators were put at each end of the chain of computers.

Acorn had supplied us with two 8Mb A5000's as well but unfortunately the memory expansions hadn't survived the transit so they couldn't be used – another reason why it turned out to be so important testing the system before going to site, and why we had such a motley collection of machines.

Once the machines were running and I had spent some time exploring the hard disk sharing facilities of Acorn Access, I set about installing the network versions of ArtWorks and Publisher.This is where I hit the first software problem – they refused to run claiming that they weren't on a network.

This surprised me as the cards were installed and disk sharing was working without a hiccup. After several phone calls – I had no documentation as the information was stored on the hard disk of one of the failed 8Mb A5000's – I got to the other end of the scale. ArtWorks and Publisher were happy to run, but now the system wanted passwords to work.

More phone calls and I reached the happy medium where everything worked.

The Eagle M2 card was installed and the Canon Ion camera tested. I predicted enormous difficulties getting these two to talk to each other, and was pleasantly surprised to have no problem whatsoever. Using the video output from the camera and the digitise video input and options on the Eagle M2 gave perfect results.

The Canon Ion camera is a very nice piece of kit, storing 50 pictures on one video disk, allowing you to

view them one at a time, wipe individual ones or the whole lot in one go. There was no documentation (again) so some of the more sophisticated options were beyond me – I could make them work but didn't know what they were doing.

I would have liked to use more of the Eagle M2 cards facilities, like grabbing video and creating Replay files and complete interactive multimedia applications, but this time around it wasn't possible – perhaps next time.

The fonts, from ArtWorks and other sources, finally occupied 12Mb of hard disk space and to avoid ridiculously huge font selectors they were carefully divided into alphabetic directories – all the fonts with names starting with A, then B and so on.

We didn't use most of them, but they were there in case they were needed.

The real set-up

Disaster struck almost as soon as we arrived and began to set up: The A420's monitor started to behave erratically and finally failed completely. There was no way to get a replacement so we solved the problem by swapping it with the 2Mb A5000 and running the server without a monitor. This occasionally caused problems when we needed to see what the 2Mb machine was doing because simply plugging in the monitor produced a confused display.

Then another problem appeared which had nothing to do with the computer network. Our rather old 6-page-per-minute laser printer wasn't really adequate to the task of producing hundreds of newsletters. Some fast action resulted in the system being supplemented with a photocopier – in fact three photocopiers – but that's another story.

By noon of the first day things began to get interesting and pairs of reporters were sent off looking for stories, and a newsdesk was set up for taking classified ads and input from the attendees.

The camera was used extensively and the pictures reproduced fairly well – although a 600dpi printer would have been better. The first issue of the Erin Testaments was put together and final proofs created then photocopied.

The reporting teams then became the sales team going out to the attendees.

From then on the whole system ran very smoothly. We had no real hiccups – our 2Mb fileserver occasionally crashed but this was due mainly to its lack of memory. And a simple restart handled it – although we learnt something interesting about the printer at the same time: It had to be switched on *after* the computer or it wouldn't play.

We found Acorn Access to be fast and reliable. In four days of hard use, and in conditions that were not optimum, we didn't lose anything. Loading of large applications across the network didn't appear to take any longer than straight off the hard disk. And the wide diversity of machine types was completely irrelevant.

We all had a good time and Acorn machines proved they were a match for the environment, apart from the one monitor – which wasn't an Acorn one anyway.

The staff

Having had lots of experience with this type of event before there was one serious problem that I'd had to overcome well before the event started. The problem of staff. On the one hand it's nice to use people who are involved in the event – however it has two major disadvantages: They tend to lose interest and wander off to join in the fun and games, and they're not familiar with Acorn machines or software.

I solved both problems by inviting people who knew Acorn machines and weren't particularly interested in live role-playing games. In the end I had a staff of four, though three of them could only work for half the event.

So I'll just take this opportunity to thank our games writer, HAL, and his two accomplices for their sterling work as reporters and hardware support, and Dave Matthewman, Deputy Editor of Acorn User, who fell naturally into the position of Editor of the Erin Testaments.

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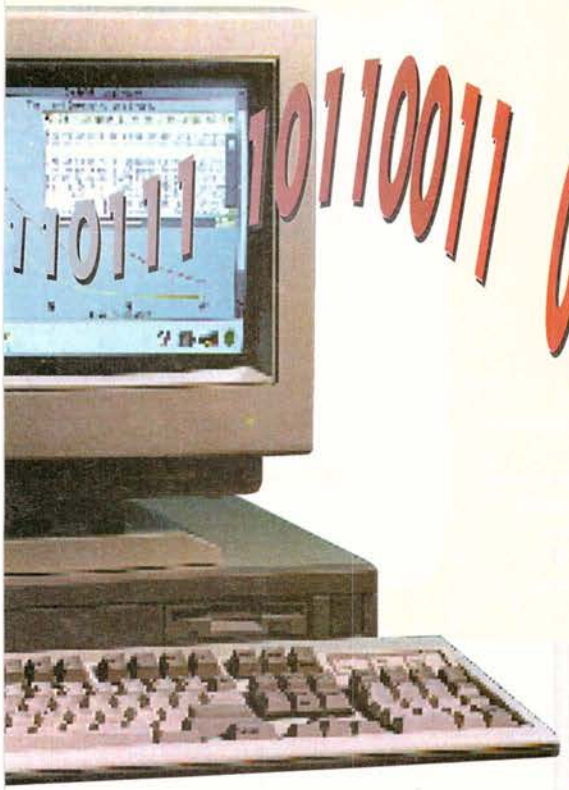


The nuts and bolts

Mark Smith takes the lid off Acorn machines and computer technology in general

IN 1946, the first purely electronic calculator, the ENIAC, was completed at the university of Pennsylvania. One of the most eminent mathematicians of the time, John Von Neumann, was a consultant for the project. One thing apparent to Von Neumann was that programming computers with large numbers of switches and cables was very tedious, time consuming and rather inflexible. He had the novel idea of storing programs in the memory along with data. He also realised that the system of storing decimal digits using 10 vacuum tubes was very inefficient and decided to use a binary system with each binary digit being stored using one vacuum tube.

Although the technology used inside computers has changed in the last 40 years, most machines are still based on the same principles as Von Neumann's and Acorn machines are no exception to this.

System partitioning

The main parts of Acorn's current machine architecture can be seen in Figure I. As you can see it has been split into functional blocks as follows:

- The processor (ARM) – the *heart* of the computer. It runs programs and, in most cases, performs all calculations required by those programs.
- The memory controller (MEMC) – allows the ARM processor to use standard dynamic ram chips for data and program storage. It also allows the memory fitted in the machine to be partitioned into several separate areas, each used for a different purpose.
- RAM – providing standard dynamic random access memory.
- The video controller (VIDC) – works with a wide range of monitors to provide a screen display. It also handles audio (sound) output.
- ROM – or more correctly, read only memory which contains RISC OS.
- The input/output controller (IOC) – lets the machine talk to external peripherals such as disk drives, printers and expansion cards.

The address and data latches are present to allow some parts of the machine such as ROM and input/output devices to be accessed at a slower speed than the rest of the system. Over the course of this series I will be looking at each of the above blocks in more detail.

Bits, bytes and words

All calculations that take place within a digital computer are based on the binary number system – the computer only *understands* 0s and 1s. These are represented by voltages, 0 volts represents a 0 and 5 volts represents a 1. A single 0 or 1 is called a bit (binary digit). A collection of eight bits is called a byte. A collection of n bits is called an n bit word.

By treating these *collections* of bits as a binary number, any number between 0 and 255 inclusive can be represented as a byte and a 32 bit word can represent any number between 0 and just over 4 thousand million.

Communication, buses and address space

So, the computer contains a number of functional blocks, but in order to do anything useful they have to be connected together in some way. The main communication within the computer takes place along *buses*. A bus is a number of parallel copper tracks on the main circuit board, each of which can carry one bit. Therefore, the whole bus can carry a binary number which has as many bits as the number of copper tracks.

In Acorn's 32-bit machines, in common with most microcomputers, data is moved between the processor, the memory, the video controller and other IO along a data bus. In this case, I'm

➤

talking about a bus which is 32-bits wide – 32 parallel copper tracks – hence the *32-bit* label.

Also, in order to identify the particular data that is being transmitted along the data bus, there is an address bus. In current Acorn machines this is 26-bits wide. The 26-bit address bus allows just over 64 million bytes to be addressed by the system – it has an *address space* of 64Mb.

ARM 250 – a computer on a single chip

Before looking in detail at the function blocks which make up an Acorn computer, it is worth mentioning the ARM 250. This is used by Acorn in some of its most recent machines, the A3010, A3020 and A4000, to provide powerful computer systems at a competitive price.

This includes a number of the functional blocks shown in Figure 1: The ARM Processor, MEMC, VIDC and IOC. In fact, the only external chips that it needs to function are some ram chips, some rom and a peripheral controller chip to enable it to use a disk drive, a hard disk and external peripherals such as a printer.

In fact, because these blocks exist as *macrocells* in the libraries of a number of large chip manufacturers – those that have been licensed by ARM Ltd – chips like the ARM 250 can go into production fairly quickly if a need arises. The design time of such chips is minimal because most of the design work has already been done. The cells simply need to be placed together and connected up. The chip would then be simulated to check that the connections have been made correctly and that the cells work together as expected before the masks are produced for fabrication.

The ARM processor

Although most programmers use languages such as Basic, Pascal and C, in which very complex instructions can be written, processors can generally only execute simple *machine code* instructions. These include instructions such as add two numbers together or store a number in a particular memory location. In order to run a C program, it must first be *compiled* to machine code.

In the case of the ARM processor, the instruction set is particularly limited because it is a *Reduced Instruction Set Computer* or RISC processor. In fact there are only about 25 basic instructions, although most of these can exist in many slightly different forms. In contrast, a *Complex Instruction Set Computer* or CISC processor can provide many hundreds of different instructions and can perform in functions in one instruction that might require many ARM instructions. For example, a CISC processor might provide an instruction to copy the contents of a block of memory to another block of memory, whereas the ARM needs many instructions to copy a block of memory.

The reason for using RISC as opposed to CISC is that most of the more complex CISC instructions are hardly ever used. By removing them from the instruction set, the processor becomes smaller and also, the remaining instructions can be executed more quickly. The smaller size brings many benefits, not least that the processor is cheaper to design and manufacture.

Because the remaining instructions are executed more quickly, complex functions that originally might have been executed with one instruction do not take much longer with multiple RISC instructions, while code that only made use of the simpler instructions anyway can run significantly faster.

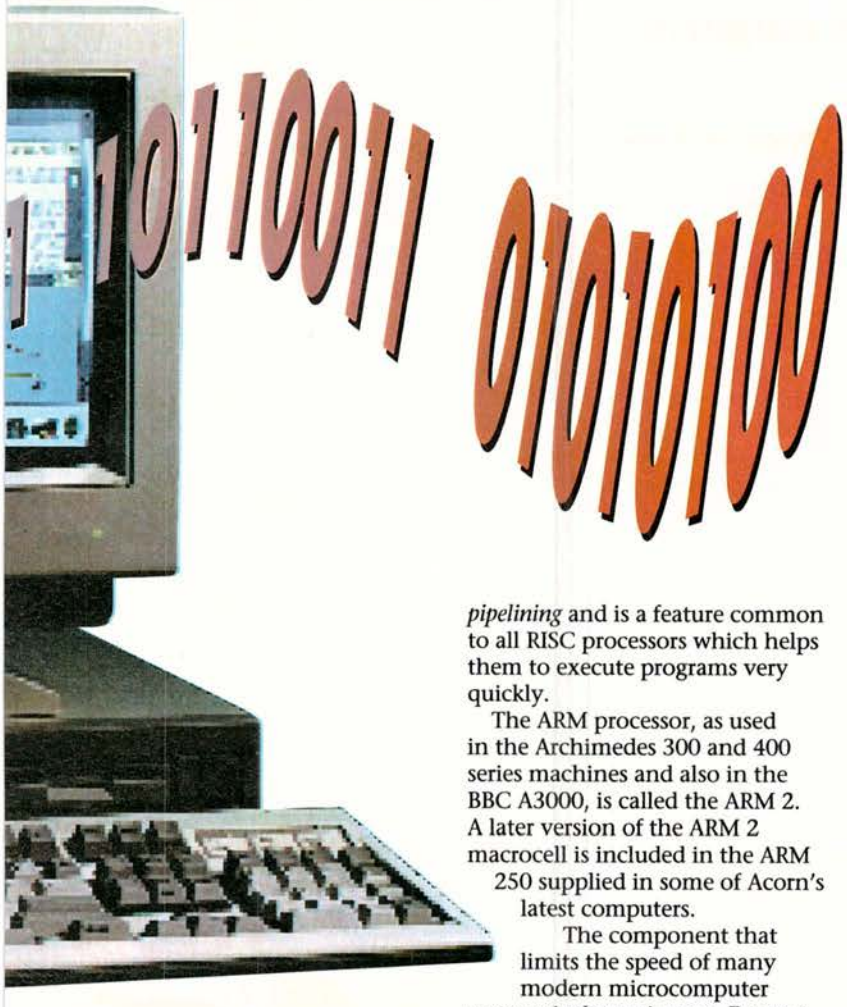
The ARM works by executing a series of instructions, one after another. It has 27 32-bit registers. Some of these have special purposes – one holds the address of the next instruction to fetch from memory, others are general purpose and can be used to hold intermediate results of calculations. A typical instruction looks like this:

```
ADD R0,R1,R2
```

This tells the processor to add together register 1 and 2 and put the result in register 0. In fact, all instructions are held in memory as 32-bit words – the above representation is purely for the benefit of programmers. Some of the 32-bits tell the processor that the instruction is ADD, some contain the two source register numbers, and some will contain the destination register number. To the processor, the above instruction is:

1110 0000100 0 0001 0000 00000000 0010.

The first four bits mean that the instruction should always be



executed, regardless of the current processor status. The next seven bits tell the processor that this instruction adds two registers together. The 0 following those means that the processor status flags should not be set to reflect the result of the calculation. There are then two sets of four bits which indicate the first source register and destination register respectively.

Finally, the remaining 12 bits tell the processor about the second source register. The first eight of these indicate that the register should be used directly without shifting bits to the left or right first – this facility could be used to multiply or divide the second register by a power of two before using it in the calculation. The other four bits indicate the register number.

While this instruction is being executed, the ARM is also busy decoding the next instruction to work out what it should do, and fetching the next instruction after that from memory. This is called *pipelining* and is a feature common to all RISC processors which helps them to execute programs very quickly.

The ARM processor, as used in the Archimedes 300 and 400 series machines and also in the BBC A3000, is called the ARM 2. A later version of the ARM 2 macrocell is included in the ARM 250 supplied in some of Acorn's latest computers.

The component that limits the speed of many modern microcomputer systems is the main ram. For cost reasons, this is usually standard dynamic ram chips with an access time of around 80ns – for the A540 and all later Acorn machines, 120ns for earlier 300 and 400 series machines and the A3000. This gives a maximum clock speed of 12MHz (8 MHz for earlier machines). However, a different type of ram, called static ram, is also available and can have access times of 20ns or lower. The problem is that this type of ram is considerably more expensive and is more bulky than dynamic ram.

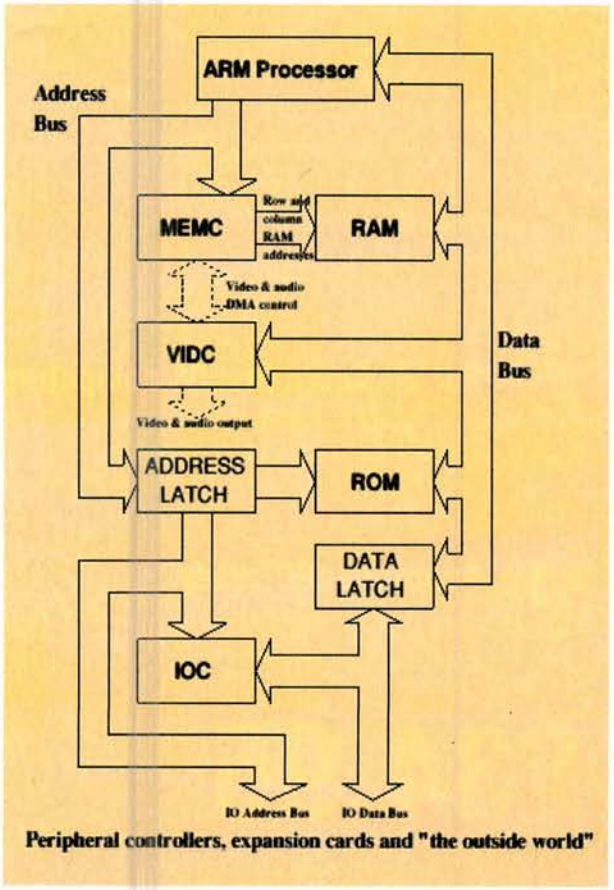
The solution is to have a processor use dynamic ram as its main memory, but has a small on-chip static ram cache to store data and instructions that the processor reads from the main memory in case they are required again. If the processor requires data or an instruction that is held in the cache, it can get at it very quickly instead of having to read from the relatively slow main ram. Obviously, data has to be removed from the cache in order to make room for new data – the algorithm used to decide which data should be replaced has been, and still is, the subject of a great deal of research.

The ARM 3 is similar to the ARM 2 processor. However, one of the differences is that it carries an on-chip static ram cache that is 4k in size. The replacement algorithm is random – the on-going research has yet to prove that any other replacement algorithms give a significant improvement over this.

Replacing an ARM 2 processor with an ARM 3 can, in some cases, allow a machine to run at up to three times its original speed. The Archimedes 540 and A5000 are fitted with ARM 3s as standard – most older machines may easily be upgraded.

Unfortunately, machines fitted with an ARM 250 cannot easily be upgraded – the ARM 250 would have to be replaced with a *mezzanine* board containing an ARM 3, MEMC, VIDC and IOC which is a rather expensive operation. For this reason, no commercial upgrades are available for these machines.

● *Next time we'll continue with a look at memory management.*



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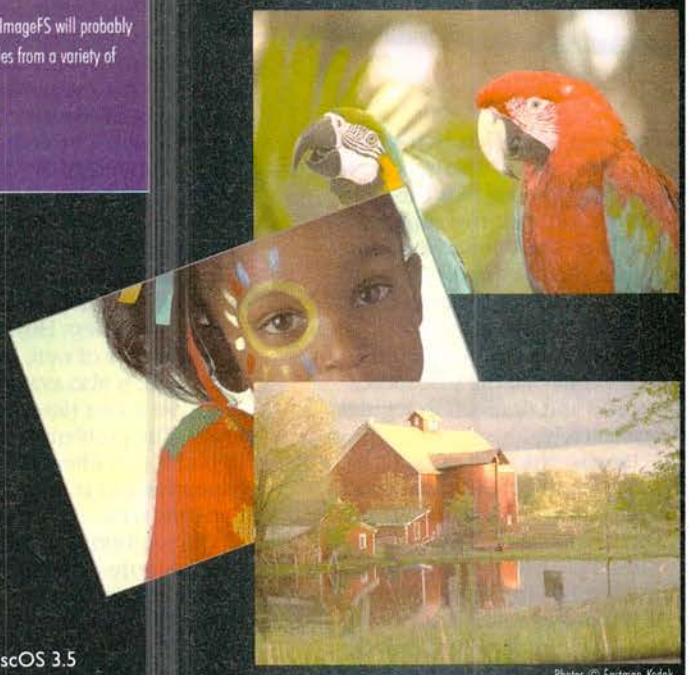

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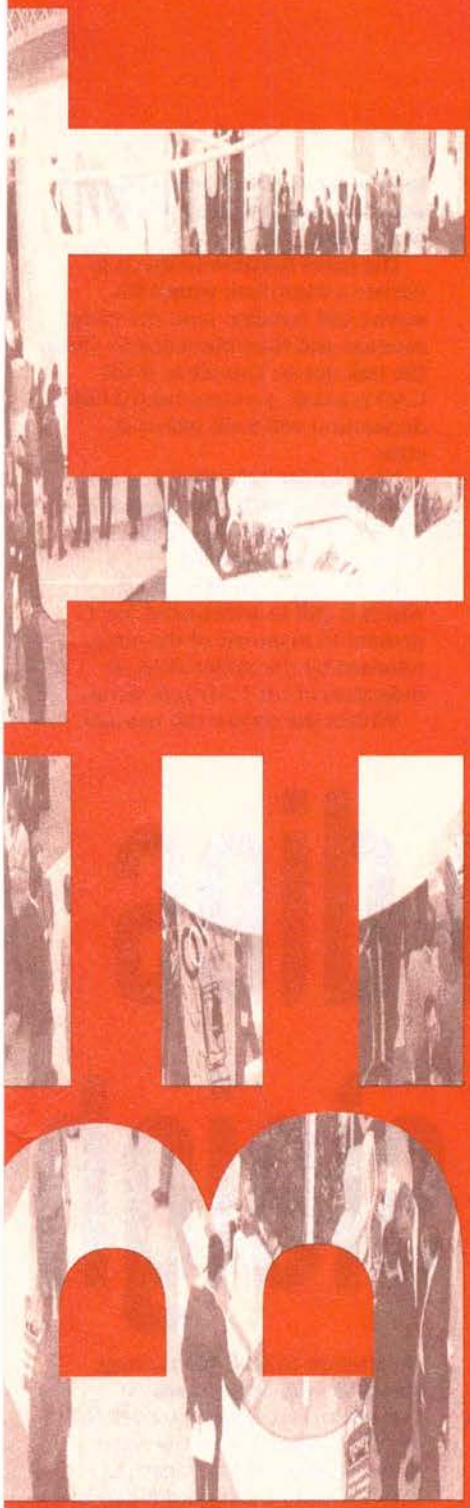

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Santa dies in sleigh

A RELIABLE source close to the Claus family has disclosed the tragic circumstances surrounding the devastating events that occurred late last night.

The combination of a pre-Christmas test drive and several large glasses of whiskey... but no, of course I'm not serious – Santa is as well as he's ever been. I'm sorry, I must apologise. You see, ratings being what they are, I had to come up with something to grab your attention.

It ended up being a choice between the sleigh crash and the Edmonds-Blobby sex scandal, so, libel actions in mind, I thought I'd better stick with the obviously fictional report.

All change

Which reminds me, talking of shortcomings and getting back to what I'm supposed to be writing about – the font manager. Although RISC OS's outline font manager has always been very smart, there are one or two pitfalls within it. One such which I've recently encountered concerns the way new fonts are made available to the system when a !Fonts directory is double-clicked.

In the August 1994 TechForum I described a modification to some of the draw file-related functions within RISC_OSLib, needed to enable a user to be warned if one or more fonts required by a text area are unavailable.

This gives the user a chance to locate their !Fonts and boot or run it as required. However, you will usually find that it is then further necessary to manually force a redraw of the font containing windows, to make use of the fonts which have just become available.

It would be better if font-using applications could automatically respond to the presence of new fonts and immediately redraw their relevant windows.

RISC OS already goes most of the way to allow this – a service call, Service_FontsChanged (&6e), is broadcast when Font$Path is altered, which generally reflects the addition of a new active !Fonts directory.

That's just great, if you're a module, but not a lot of help for most applications. What's needed is a tiny intermediate routine, taking the form of a module, which notices this service call and converts it into an application-friendly communication – the most natural being a broadcast message.

On the MegaDisk you'll find a module called FontChange. This will provide just such a patch. It uses message action &43940, which has been officially allocated by Acorn to me, albeit via a rather convoluted root – see the source code for an explanation.

Strictly speaking, to be put into distributed use the module name should also be registered, and it hasn't yet been. If anyone wants to use FontChange without modification in a commercial product, contact me and I'll put in a request to Acorn.

Although FontChange carries out the single simple task of converting a service call into a Wimp message, thanks to the restrictions imposed by the Wimp it does have to make use of a slightly unusual bodge which I haven't seen anyone else use, and is perhaps worth an explanation.

At first thought, all that seems to be necessary is a service call handler which calls *Wimp_SendMessage* in response to a *Service_FontsChanged*.

Unfortunately, this SWI can only be called if the Currently Active Object (CAO) is a wimp task, and when low-level code is executed, such as service or interrupt handlers, and SWI code, this may or may not be the case.

The naive solution to this is to declare a wimp task within the service call handler, send the wimp message and then immediately close the task down. Trouble is, if the CAO is a task, a second nested task declaration will itself spawn an error.

Now, under RISC OS 3 you can first check to see if you are a task, via *Wimp_ReadSysInfo* (r0=5). However, for backwards compatibility with RISC OS 2, which is still in widespread use, I decided to make use of the errors returned by the earlier SWIs, as indicators of the CAO task status.

Within the service call handler we attempt to send the message using *XWimp_SendMessage*. If this returns an error, we check to see if it is *Invalid Wimp operation in this context* (&281), meaning the CAO isn't a task, and if this is the case, declare a task, re-send the message, and finally kill the task off.

This seems to work!

Interestingly, you might have thought you could also take the reverse approach of first trying to declare a task via *XWimp_Initialise*, and use a returned error to flag that the CAO was already a task. If you try this, you'll discover it won't work. The SWI does generate the expected error when the CAO is a task, but despite the X bit set status of the SWI, the error isn't returned to the module code –

instead, a *Wimp_ReportError* via external error handling is always invoked.

Constantly divided

If you're a regular reader of this column, you'll recall September's foray into high speed assembler division where the divisor is a constant. This used handwritten code to deal with each constant, and I asked if anyone could come up with a macro to automatically generate such routines.

In last month's issue, two solutions to this problem were included.

Now we have the definitive version, from **Samuel K. R. Smith**. All Samuel's code is included on the MegaDisk in directory FastDiv. Several other entries have also been received. **T. R. Tanner** deserves a mention for being the first person to submit some explanation of how their algorithm works.

The key part to any such procedure is calculation of the length and value of the repeating component of the binary expansion

crash

Michael Rozdoba exclusively reveals

to 1/divisor. The inset *Tech Info Addendum* explains how this can be achieved.

Meulman managed?

Dr Peter Meulman of Queensland – that's Australia, not Basingstoke – wrote in wanting to know if he can change which of !Printers' printer drivers is selected, under program control, rather than requiring the user to manually click on the desired icon.

He's assembling a complete solution for a medical practice – software and hardware combined for a dedicated task – so this deviation from the RISC OS style can be forgiven. The short answer to his query was *Go away, you're making my head hurt.*

However, a few aspirins reveal the true answer – yes, obviously, since !Printers does it. Unfortunately, it will probably be impossible for you to implement this yourself.

Consider the structure of the RISC OS 3 printing system.

First we have an assortment of Printer drivers, such as 0-PDriverPS for PostScript and 7-PDriverDP for PDumper, supporting generic bit image devices. These are the Acorn supplied ones – there are also various third-part options, such as 5-PDriverLD for LaserDirect.

The PDriver *can* be set with PDriver_SelectDriver (PRM 3-643), though you aren't meant to use this SWI. However, that's just the start of your trouble.

You'll probably need PDriverDP, which itself uses any of several printer dumper modules – 1-PDumperDM for integrex/epson, 2-PDumperLJ for laser jets and 3-PDumperIW for image writers. Again, these are only the Acorn options – there are more third-party ones.

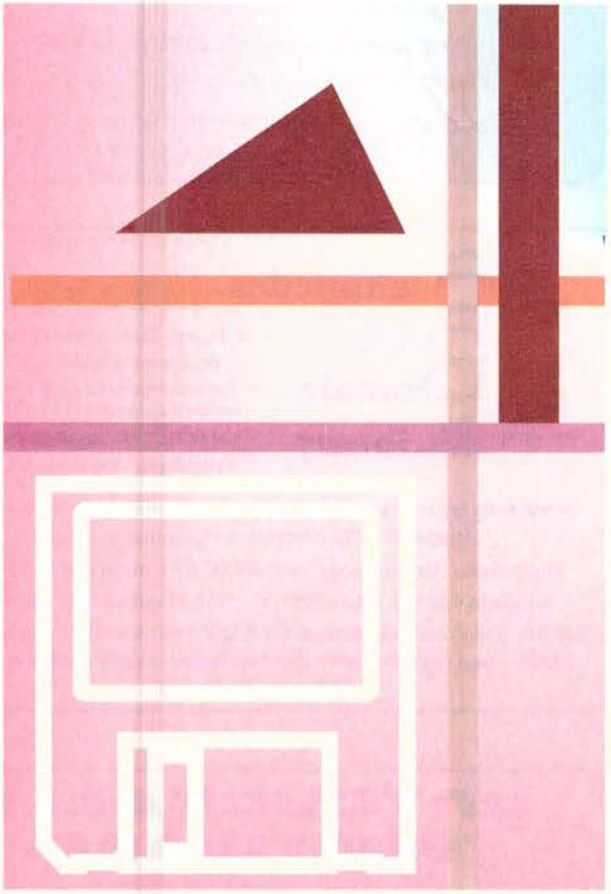
Each of these typically utilises any number of printer specific definition files, all of which would get their own icon under !Printers.

So, to make a printer current if it uses PDriverDP, you will also need to specify a dumper module. This can be done with PDriver_SetDriver (PRM 3-656). However, as you'd expect from the above account, this requires that data derived from a specific printer definition file be supplied to the SWI, and that involves decidedly non-trivial code.

In conclusion, I'd say forget about trying to set this lot up yourself, and stick with !Printers and its pretty little icons.

Nevertheless, do not despair. While I couldn't think of a direct way to solve your problem, a little lateral thought brought forth a workable solution. Although you can't replace the selection mechanism provided by !Printers, there's no reason why we can't replace that part of the human-computer interface which usually does the mouse clicking on the chosen printer icon – I've resorted to simulation!

PIconer on the MegaDisk is a small Basic application which



changes the chosen printer by faking a mouse click event on its !Printers' icon. Clever or what? The relationship between icon number and printer can be determined at the outset in the same way, by trying each of !Printers's icons and seeing which printer becomes current.

This did inspire a few novel twists, not least the need to disable the shift keys temporarily, since if !Printers detects Shift being pressed while processing the mouse click event, it will open the *Printer configure window* rather than change the selected printer, just as it would if you manually shift-select clicked on the icon.

Incidentally, if Dr Meulman, or anyone else, wants some help with an involved system-specific problem unsuitable for TechForum, feel free to get in direct contact with me – I'm always available for a spot of private consultancy work. (*Oi, none of that. Ed.*)

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What's my line?

Steve Turnbull explores how to draw fast horizontal lines

THE most common operation in 3D graphics is drawing a horizontal line on to the screen – every geometric object is composed of faces and every face is drawn as a collection of horizontal lines.

So our task this month is to produce the fastest horizontal line drawing routine that we can – but before that I need to correct an error from the last issue and re-design the file structure we're building to make our programs easier to develop and test. First the error.

In the screen selection routines last time I specified that the program would select Mode 13 for TV-type monitors, which is fine, and Mode 47 for VGA ones, which isn't. The 256-colour Acorn game mode for VGA is Mode 49. The routines on the disk this month have been adjusted for this.

I have completely re-structured the way routines and data will be held in our application. Figure I shows what the structure now looks like, along with the system variables which we can use to access the library routines and data.

Every separate library routine has an *init*, *run* and *quit* procedure which should be called at the appropriate time – you can see from the examples used this time how it all works.

Drawing the line

Let's now look at the problem of line drawing and some of the assumptions we're making. First of all I'm assuming that each line will be plotted in a single colour – we may allow dithering later but not yet. We also assume that the line drawing routine itself accepts three values when it's entered:

- r0 The colour to be plotted, the same colour is repeated in each of the four bytes of the register.
- r11 The length of the line to be plotted, in bytes.
- r12 The address to plot at.

And that the routine that calls the line drawing code will take responsibility for clipping the line to the edges of the screen or viewing window if it's not the whole screen.

This keeps the line-drawing code very simple. All it does is plot a series of bytes in colour (r0) and length (r11) starting from address (r12). We also assume that all registers will be preserved when the routine exits.

The very simplest horizontal line plotting code is this:

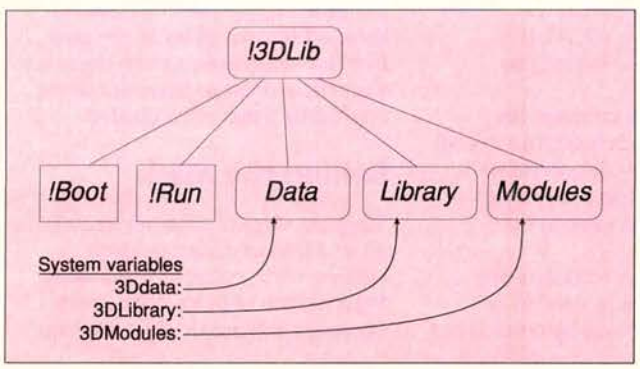
```
.loop
        STRB    r0,[r12],#1
        SUBS    r11,r11,#1
        BNE     loop
```

This first instruction plots a byte from r0, at the address in r12, and then increments r12 by one. The next decrements r11 by one and sets the flags according to the result, the final one branches back to the start of the loop if the result is not zero.

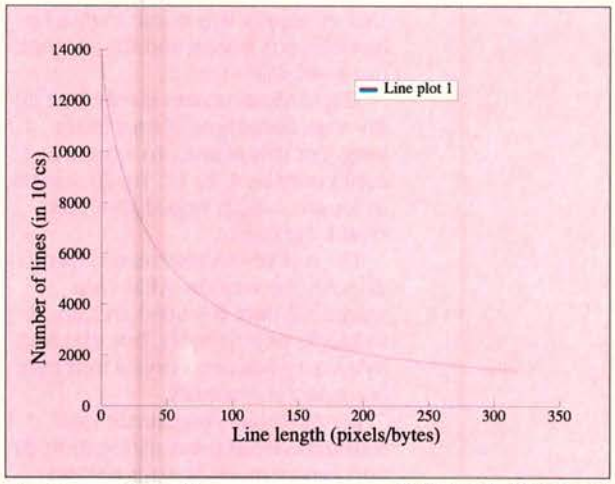
This routine is implemented as *LinePlot1* and you can run it by double-clicking on the *LineTest* program, and entering 1 when asked for the version you want. *LineTest* plots lines of length zero up to length 319, using the given version over a fixed time interval for each line, and counts the number of lines drawn in that time. The data is output to the *LineTest* directory as a CSV file.

The graph in Figure II shows how, using this algorithm, the number of lines plotted in a fixed length of time decreases as the length of the line increases. This routine could be used but it's not efficient enough for our purposes.

Instead of the *STRB* command which plots one byte at a time, we could use the *STR* command which plots four bytes at a time –



● *Figure I: The structure of the development system*



● *Figure II: The simple line plot algorithm isn't very good*

➤

obviously this would be four times as fast and the code ought to look like this:

```
.loop
        STR     r0,[r12],#4
        SUBS    r11,r11,#4
        BNE     loop
```

Unfortunately this doesn't work for one obvious reason and for another not-so-obvious reason.

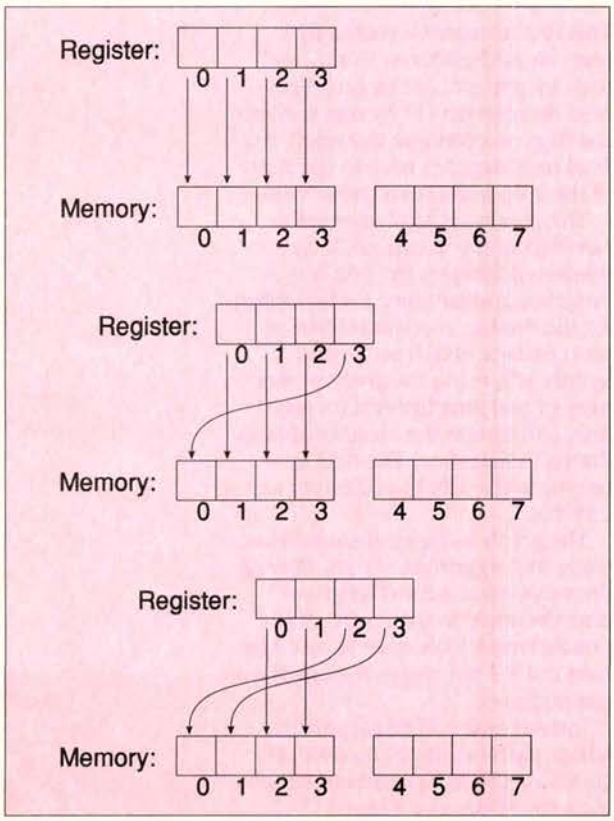
The obvious reason is this: Not all lines are a multiple of four bytes long. For this routine to work a line could only be 4, 8, 12, 16, 20... bytes in length, which would give very chunky graphics.

The not-so-obvious reason has to do with the way the ARM chip works. All data is loaded and saved in blocks of four bytes, but that four bytes may not cross over a four byte boundary in memory.

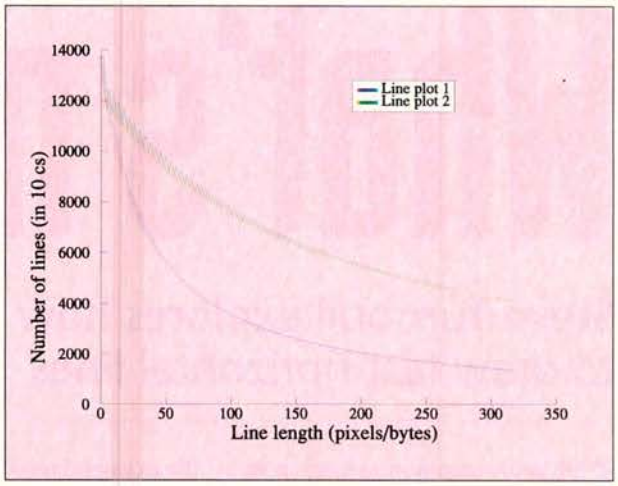
For example, you cannot load four bytes from memory location #1 and expect to get in your register bytes #1, #2, #3 and #4. You won't. What you get is #1, #2, #3 and #0 as shown in Figure III. The same happens when you try to store a register back into memory.

This might seem awkward, and it is, but it's one of the reasons why the ARM chip is fast. So we have to work with it.

● *Figure III: Plotting complete words only works on word boundaries*



● *Figure IV: Plotting in complete words is faster*



Into alignment

With these two reasons why we can't use the fast 4-byte method, we have to produce a system that plots up to three initial bytes which will align the address (in r12) to the word boundary, then plots in complete words up to nearly the end, and then plots up to three final bytes to complete the line.

The first step is to find out whether there are any initial bytes to be plotted, and if so, how many the following operation does it:

```
ANDS    r10,r12,#3
BEQ     no_initial_bytes
```

The first command isolates the bottom two bits of the address in r12, puts them in r10 and sets the non-zero flag if there are any, allowing us to jump if there are none to do. We can then use a small loop to plot those first few bytes:

```
.initial_loop
        STRB    r0,[r12],#1
        SUB     r11,r11,#1
        SUBS    r10,r10,#1
        BNE     initial_loop
```

We plot a byte, increment the address (r12), decrement the overall byte count (r11) – otherwise we'll end up plotting too many bytes – and decrement the initial byte count (r10).

The next step is to isolate any final bytes that may need to be plotted, which we do by cutting out the bottom two bits of the overall byte count in r11:

```
.no_initial_bytes
        AND     r10,r11,#3
        BIC     r11,r11,#3
```

The first command extracts any final bytes to be plotted and the second zeroes the bottom two bits of the overall byte count, just to be on the safe side. We can now use the faster, word-based, plotting loop.

When that's complete we check to see if there are any final bytes to be plotted and if so we do them:

```
.final_bytes
        MOVS    r10,r10
        BEQ     exit
.final_loop
        STRB    r0,[r12],#1
        SUBS    r10,r10,#1
        BNE     final_loop
```

The first command is used to test if r10 is zero. If it is there's nothing to plot so we just skip out to the exit, otherwise the final bytes are plotted.

This routine is coded as *LinePlot2* and you can use *LineTest* to try it out. The graph in Figure IV shows how the two versions compare. The jaggedness of the line is caused by the plotting of either one, two or three additional bytes at the end. *LineTest* always plots from the same, aligned, address so there are never any initial bytes to be plotted.

Behind the mask

The next stage of speed-up requires a bit of a leap of understanding because we're going to break away from the use of loops completely. Loops are inherently slow, so if we

can do away with them that's almost certainly going to improve things.

The next part of the trick involves looking at r11 – the number of bytes to be plotted – in a different way. We'll just look at the middle part of the routine for the explanation.

At the start, r11 contains the count of bytes to be plotted stored as a binary number, but by the time we get to the middle part of the routine it actually contains the number of *complete words* to be plotted multiplied by four. So, if we shift it twice we can divide by four. r11 then contains the actual number of *complete words* to be plotted.

If bit zero of r11 is set, it means *do plot a word,* if it's clear it means *don't plot a word.*

If bit one of r11 is set, it means *do plot two words,* if it's clear it means *don't plot two words.*

If bit two of r11 is set, it means *do plot four words,* if it's clear it means *don't plot four words.*

If bit three of r11 is set, it means *do plot eight words,* if it's clear it means *don't plot eight words.*

And so on. Figure V shows how this works in a slightly more graphical way.

We can use the pattern of set and clear bits in r11 to decide how many complete words need to be plotted at each stage as we step through r11 one bit at a time. And when it comes to the plot itself, instead of using just r0 we use any available registers with the colour in them and plot them all in one instruction using the *STM* (store multiple register) instruction.

There is a limit because we can only use eight registers (r0 to r7), but even then we can use two STM commands one after the other, then four of them, although at this point – I discovered by testing – it becomes more efficient to use a loop.

The key command is:

```
MOVS    r11,r11,LSR#1
```

This performs two tests in one. The LSR#1 shifts the contents of r11 putting the bottom bit into the carry flag, and then tests the remaining bits to see if they are zero, which means we can follow it with:

```
STRCS   r0,[r12],#4
BEQ     final_bytes
```

The store command is only performed if the bottom bit was set, and if there are no more bits set the remainder is zero and we can skip out to plot any final bytes and then exit.

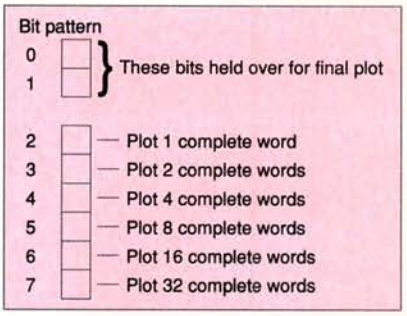
The other possibilities may be that the bottom bit was clear, so no word was plotted, but there may be more to do so the branch is not taken, in which case the next part of the code is:

```
MOV     r1,r0
MOVS    r11,r11,LSR#1
STRCSIA r12!,{r0-r1}
BEQ     final_bytes
```

Copy the colour into r1, check to see whether we need to plot and if there's more to do, plot two words if needed and exit if no more. This is followed by:

```
MOV     r2,r0
MOV     r3,r0
MOVS    r11,r11,LSR#1
STRCSIA r12!,{r0-r3}
BEQ     final_bytes
```

Copy the colour into r2 and r3 and repeat the same procedure. Notice how we only copy the colour into the other registers when needed – this avoids executing unnecessary commands. The rest of this middle section follows the same pattern until it reaches a simple loop right at the end.



● *Figure V: Using the bit pattern to speed up plotting*

It was at this point I realised that both the initial and final byte plotting could also be changed to use this technique – this results in just one test like this:

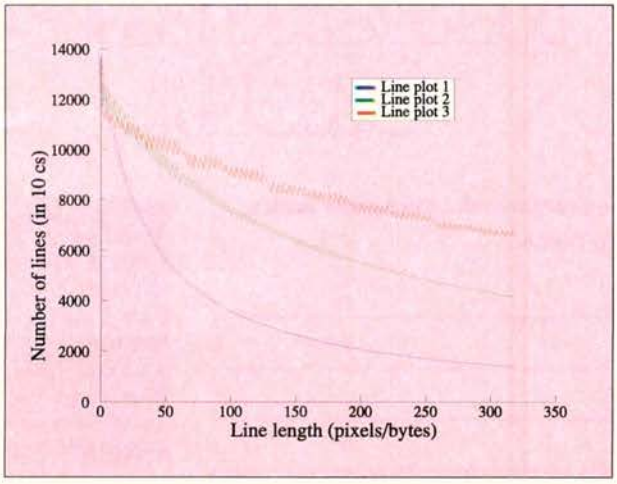
```
.initial_bytes
        MOVS    r10,r10,LSR#1
        STRCSB  r0,[r12],#1
        STRNEB  r0,[r12],#1
        STRNEB  r0,[r12],#1
```

And likewise for the final bytes. This code is implemented in *LinePlot3* which you can test, again, with *LineTest*. The graph in Figure VI shows how the three techniques compare.

The overlap for short lines, where the latest version isn't as good as the earlier ones, may result in using *two* separate routines depending on how long the line is.

The obey file called *RunLineTst* executes a test of all the routines generating CSV files, giving the results of each, and a file called *Nums* which is a list of all the line lengths tested. Using this with the other CSV files, you can generate your own graphs for your machine – the ones shown were produced on a PC600 with VRAM which makes a considerable difference.

There were a lot of different versions of the code as I worked through these routines again and again, and it took several solid days just on the horizontal line plot. It shows how it can pay to spend time on just one aspect of a piece of code.



● *Figure VI: Getting even faster with the bit pattern technique*

● *Next time we'll see how to plot a polygon on screen, and start in on the data structures we're going to need to create our 3D universe.*

NEXT MONTH

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Kitchen capers

LAST time, in this solution to Wonderland, you were left outside the magnificent palace, and now it's time to proceed inwards. First, though, we've got to get hold of a little liquid refreshment. The palace driveway contains a fountain which is swathed in a sherbet mist. Remember the cup we found in the kitchen cupboard? Put it in the mist and there you are – even though the fountain then quits.

Now go south and west into the palace grounds, pause to admire the animation, and grab the gardening gloves before going east, south and south to the horse chestnut tree. Here fans will recognise the Cheshire Cat from its grin – and get the second pouch and the saucer by way of booty.

Two moves northeast and two southeast will take you over the rickety bridge to the giant elm tree. Northeast, northwest and northeast again along the wiggly-waggly path will put you in sight of the Duchess' house and a fork – take it.

One more move northeast puts you outside the kitchen window, and the text provides plenty of clues that anti-pepper precautions will need to be taken before long. Meanwhile, move north again and enjoy the animation sequence outside the front door of the house. Open the front door and go east into the lounge, where you should examine the table, and then take the gazettes so that you can get at the next playing card which is the two of diamonds.

Now pop the precautionary peg on your nose – the one from the rabbit's clothesline, silly – so that you can continue your explorations in this highly explosive environment. Examination of the bookcase will show that there is a glasses case on it, so take that, examine it and take the small lens inside: The gazettes can now be dropped.

Go upstairs and then east into the Duchess' bedroom – ignore the off-putting room description and look under the bed. There are some slippers here and – if you've read the kitchen clues aright – you'll know that something is needed to deaden the sound of your footsteps, so help yourself, remove your shoes and wear the slippers instead. Apart from anything else, you'll have increased your score by one point.

Next go west back to the landing and then south into the cook's bedroom, where you should remove the blue gloves and replace them with the gardening gloves for the heavy-duty work you are about to undertake. Go east into the dumb waiter and pull the rope. You'll now descend to the kitchen area and I strongly advise you to save here before proceeding any further.

The kitchen environment is exceedingly hostile: One false move and you will be bumped out of the game – minimal moves are mandatory. You need to get the glass key, the knife from the rack, then open the cooling cupboard and take the jug which contains cream to give to the Cheshire Cat later. You have a single move before the cupboard door slams and draws attention to you with disastrous results, so simply move east back into the safety of the dumb waiter: I was ages sorting this lot out.

Once safely in your – admittedly cramped – lift, pull the rope to get back to the cook's bedroom where you move west, north, down and east into the dining room. Now you have got the glass key you can open the magnificent glass cabinet here and get the pass which will admit you to the palace in due course. And that's where we'll pause for now.

More next time

Hot stuff

Last time in The Pawn we had been made privy to some unwelcome news – namely, that the powers that be intend our name to be spelt *Victim* while our job is to change the last two letters: Victor is a nice name, I think. So, off we go again.

I left you in the alchemists' store room and it's time to beat a hasty exit. Southwest, northwest and west take you out of the mountain onto a ledge – and you can see a dodgy looking rope bridge. Three moves north provide the answer, and you are then on the other mountain with exits northwest and northeast facing you.

Northwest brings you into the presence of a Smaug lookalike and, for the moment, we'll leave him in peace. If you try to leave without doing the right thing, he has a quick-fried pawn for dim sum: So, go northeast instead. Once in the tunnel, go north into a freshly

papered room where there are all sorts of interesting things to do – including trying to figure out why one wall says don't lean on it.

Ignore the wallpaper and paste (valuable clues, though), open the cupboard instead and look inside. You'll find a hook – ideal for tying your rope to – which provides an anchor while we take a closer look at that odd wall. If you enter the command *Examine wall* you will be asked *Which one, the stone wall or the paper wall?* and now you know why leaning was discouraged – even now, leaning on the wall will prove fatal.

What you need to do instead is to tear it with your trowel and, since that has now served its purpose, you can then drop it. Next climb down the rope onto a ledge and you can now drop the rope, too. One move south brings you to some double doors – and a test of your patience. You need to knock on the doors five times, and each knock produces some quasi-Shakespearian prose from someone on the other side.

Eventually, the doors will be opened to reveal a porter who would like you to remember him: In other words he wants a tip. Since the French for *tip* is pourboire, try giving him the scotch. Examining the porter provides an overkill of clues, in fact. After that you can go east to the top of a cylindrical shaft. Ignore the stench of sulphur and climb down.

Once down the shaft go north into the ante room where Jerry Lee Lewis is playing the piano while he sings *Great Balls of Fire* and you are told he looks hot and uncomfortable. Give him the bottle of beer and then go back south to the shaft. If you try to go east now you'll be forced back by the glare caused by your light source, so first you must put the white in the pouch and close it.

Having moved east, you find you are in a white chamber, dotted with pieces of crystal – and that is why your white needed concealing. There are three exits from the chamber, but the only one you need is north – south merely takes you into a circular chamber where there is only one exit, back the way you came.

North in fact takes you into the presence of some demons who are busily guzzling on headless corpses. If you linger here to investigate the fridge, you get noticed by one belching Beelzebub and are promptly scoffed, so I advise a swift move east into the presence of Old Nick himself. And that will do for now.

To be concluded.

For the Elite

Sixth-former son has been nagging me: He's just re-discovered ArcElite and has found that he is merely Competent while his decrepit Dad is sniggering quietly at such a pathetic attainment. What are the kills needed to be ELITE? he snarled.

Well, try this and you won't be too far off where ArcElite is concerned: Mostly harmless needs 50 kills, Poor 400, Average, 1000, Above Average 1500, Competent 2500, Dangerous 4500, Deadly 6000, Very Deadly 8000 and ELITE 9800. In the BBC version you needed 6400 kills to become ELITE so Clive and Warren upped the ante a little.

Remember some oddities in Witch Space when playing ArcElite, reported a while back? Well, this is what Tim Williams recounts: *While hyperspacing from Vetitice to Anarlaqu I was dumped into Witch Space. Having dispatched the Thargoids with an energy bomb, I performed multiple space jumps and came across a Space Station.*

Using his docking computer resulted in flying right through the station, first from the front, then from the back. Military lasers had no effect, though eventually a solitary Viper turned up and got swatted. Tim remarked that the Safe zone was considerably larger than normal.

Tim asks how to trigger the second Mission: In your case, mate, change galaxies, though I am still waiting for a definitive list of trigger factors for all the missions.

That's it for now. Happy hunting.

Hatter's helpline

I'll start this session with more of Alison Leigh's help for Haunted House fans: You can show the Queen respect by arranging the bottles in order of size and clicking Adjust on them, following the numbers on the notice to play *God Save the Queen*. Do this outside the privy and the door will be opened.

The telephone pad number clues give the route to the heart of the cellar where the shelf unit holding the Goldscheider polychrome figure is found, and where anything stolen from the van if you forget to shut the doors, or dropped on the mortuary bench, will reappear. The second number gives the route out again. The numerals indicate the number of letters in the direction words (4=left, 5=right, 8=forwards and 9=backwards).

Within the cellar, the lead spider, when placed in the web, opens the poor quality pine chest, and another spider (gold – a treasure) appears in the original wall cupboard. The ghost in the playroom wants the tennis ball, after which you can remove the treasures including the poster which reveals the red card.

Jonathan Tate adds one comment about the quarry tile obtained by giving the cat some milk and then shifting its basket: Unless you want broken pottery, the bottom of the oven should be opened first. He can also help Alison who has problems with the Habitat wardrobe on the landing and the locked cupboard in the bedroom.

Searching the bed with the Steiff bear very carefully (he writes), I found a rusty key on the bottom of the foot-end of the bed. Using this key to unlock the small cupboard reveals a bar of soap. On the landing, smashing the chamberpot reveals a key. Inside the wardrobe there is a towel and a blue glass centrepiece. Is there a better way of getting this key, Jonathan wonders?

Stephen Mumford's letter suggests so. He has this advice: The mortuary table must be used when you wish to break something in order to retrieve the object inside – for instance, the blue potty contains a key, and the tinplate robot contains a golden heart. If you drop them on the table and then travel to the centre of the cellar, you will be able to recover the object you had to break in the first place. More from him next time.

A puzzle which has been nagging at my memory-banks has finally been solved, thanks to Joyce Haslam. Her husband, Derek, wrote *Gateway to Karos* and *Mirror of Khoronz* which were published originally by AcornSoft. I loved Khoronz and therefore reckon both must be excellent text adventures.

Why am I telling you all this? Well, thanks to AcornSoft's generosity, they are available in the Public Domain from Alan Blundell, BBC PD, 18, Carlton Close, Blackrod, Bolton BL6 5DL. There are a few minor snags when running them on the Arc via 6502 emulator and the Tube, but Derek is working on conversions for the Wimp environment. If you own a BBC Micro, add them to your collection now, if you have one of the bigger Acorn machines, watch this space.

Dawn Chamberlain upgraded her A420/1 to 4MB ram and RISC OS 3.1, since when she's been unable to play any of the Magnetic Scrolls adventures in spite of trying the various tips published here from time to time. Come on, folks, there's got to be an answer.

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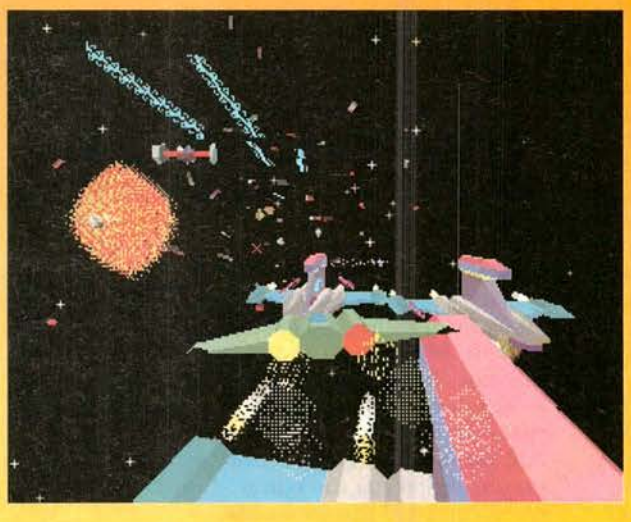

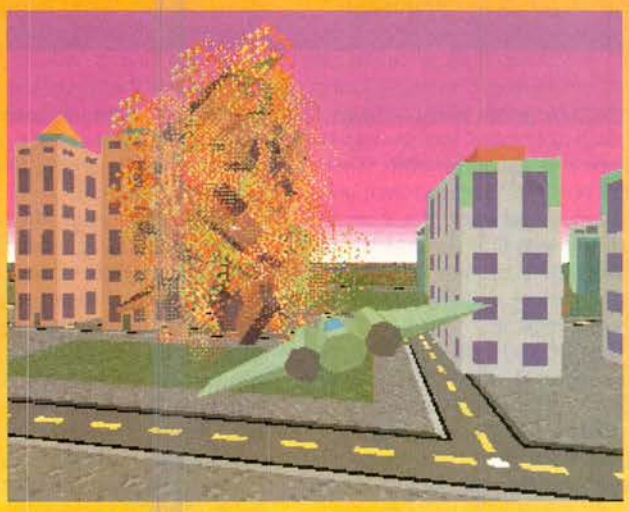

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WFE

Simon the Sorcerer

...worth the wait?

BETTER late than never is an accolade which can be made to the majority of Amiga and PC conversions for the Acorn machines. However, the delays on the release of this product were monumental and to be fair it was not the fault of Gamesware or the programming team – sometimes these things happen. For the poor benighted adventure-lover, the Acorn machine now has a graphical adventure which they can be proud of.

To set the scene, you are a young lad irritated into going into the attic by the yapping of your dog. Shut in one of the chests, there you discover Ye Olde Spell Booke. Discarding it carelessly opens a portal into another dimension which you feel obliged to enter once your dog does.

Returning the favour, the dog rescues you from lunch with the goblins – you're the main course – and only then do you discover the reason for your attendance in this strange place of Grimm, Tolkien and Lewis Carroll. You must rescue magician Calypso. Easy, but first you must become a wizard and destroy the evil Sordid. What could be simpler? Then you stock up on food and drink and sit in front of your computer screen for long hours at a time.

The animation, sound and music are beautiful, but as with all games of this type it is the small things that add the atmosphere: The stag roaming around on the rocky outcrop, the butterflies and the sheer quality of the graphics. There is not a pixel out of place.

Dying is very difficult – I didn't manage it even when being toasted by the flu-ridden dragon – and the ethos of the game is entertainment. You can save and load via the *Postcard*, and the *Map* allows you to pop between major locations once you have visited them. You can fit endless amounts of items in your pointy hat, from flaming brands to pigs, and never once does this game take itself (or you) too seriously.

● *Take time out to just enjoy the scenery*

In the speed of ensuring that the game made it to Acorn World, there are a couple of tiny bugettes which pop up very infrequently and are not worthy of a second thought. The overpowering impression Simon makes is one of quality and the humour is very well set. For example, when you are desperately thinking what to do next, Simon will remove his hat, don his walkman and tap his foot while waiting for you. You are often addressed directly and referred to in the scenario and the comedy is very tongue in cheek.

Simon is completely mouse-controlled and to find something you have to move your mouse over an area and it will be highlighted. Now be very meticulous ➤

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Recommended: Hard disk though it will work from floppies

● *Not the likely abode of a promising young sorcerer*

● *Puzzles are, as a rule, tougher than this one*

● *Okay now you're on your own – even the dog goes to sleep*

● *Ever felt small?*

here or you can miss vital items, so take it slowly and carefully and remember: The clue is in the question.

All questions are multiple choice and you can get into very involved, humorous, but essentially superfluous, conversations. You can speed up or slow down the speed of the text on screen or opt for peace and quiet. The manual is necessary for the copy protection, but that is it. This is a game which will appeal to novice and experienced adventurer alike.

Did I like Simon? I loved it. From loading the nine disks on to my hard disk I was hooked. The puzzles are nicely constructed and the illusions to fantastic literature will amuse the well read. Having now guided Simon from the village – the ducks are brilliant – to dwarf mine, from swampling to witch I am ready for giants, dragons, snowmen, woodworm, repulsers, demons and frogs.

The game finishes (yes I have completed it) with the implication of a Simon II. My Christmas wish is that it will not take so long to make it to the Acorn machines. In the meantime, I think I'll go and play it again...

Pam Turnbull

Stop press

Spring '95 will see the CD-Rom version of Simon the Sorcerer with Simon aka Chris Barry speaking in glorious tones, along with the other effects and voices of characters.

Simon II is being programmed for the PC as I write and you can expect to see this on your Acorn screens at Acorn World '95. (*Making promises is a dangerous game. Ed)*

● *Choose your response carefully*

E-Type 2 — update

...back in the fast lane

WITH the finished version now done and dusted I decided to take a look at the final version of E-Type 2 to see if it lived up to the promise of the preview versions – it does.

E-Type 2 – sometimes known as The Pink Lady – was reviewed in last month's issue and allows one or two-player action over a set of six predefined tracks. Each track has its own high score listing. Furthermore, you can opt for pursuit mode and make the most of the oil slicks, lasers, time bonuses, scoot bombs or radar blockers collected en route.

The cones of the original are there, as are the policemen, and great and awful road and weather conditions. The latter affect the way your car *holds the road* – the best place to be is dead centre. Watch out for speed traps though and keep your eyes on the gauges for revs, fuel and temperature or you could overheat and come to an ignominious end.

However, full marks for getting your money's worth must go to 4D for including a track designer in the original package.

On first glance, creating your own tracks looks a little messy, but stick with it and you'll reap the benefits. First off you create a *track script file* in Edit. You create your tracks in *bands* which have a left and right colour, a width and specific values for bends, inclines and weather. You can also add sprites using another value and its horizontal position. You can only have one sprite per band though.

The instructions are quite easy to follow so, for instance: W 160, L 4, R 8,FINE,C would give you a track width of 160, a left colour of 4, a right colour of 8, no snow or rain, and then all this is compiled. You can test your completed tracks by setting both drivers to computer and watch how they negotiate your roads.

The best place to start is by looking at the example which is the file that creates the pursuit track. This gives you an idea of the elements to putting a track together. When happy, drag your text file on to the TrackComp application to compile it. Then it's a simple matter of dragging its directory to the E-Type 2 application. As with any programming, save frequently and don't get discouraged. If you are experienced you'll find it easy to add new sprites, as long as they are not larger than 160k in a 256 colour mode with a width multiple of four.

● *Keep an eye on those gauges*

If you want to race along without a care in the world then E-Type is a cheap alternative to buying an actual car. The standard tracks will keep you busy for quite a while, played alone or in two-player mode, and for potential games writers the track editor teaches some important lessons.

Jo Giles

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SimCity

...a whole new world

SIMCITY is, arguably, not a game at all, it's what the name says: A simulation of a city. I liked the original version and played it completely unsuccessfully on the BBC Micro – when I say unsuccessfully I mean that my cities didn't last very long.

However, with SimCity 2000 I found the whole creation process much easier and at each successive attempt my cities lasted about twice as long as the previous one, until I managed to get one that would, as far as I could see, last indefinitely.

The game uses a graphical interface (windows menus and so on), so you should never need to type at the keyboard except to name specific items – and you don't even need to do that. But you'll find that the interface is a strange amalgam of PC-style icons on the windows with Mac-style menus, but it doesn't take long to get used to.

The basic game mechanisms for SimCity 2000 are the same as for the original: You are presented with a terrain of hills, flat areas and water, which may be just rivers or coastal. You specify areas that can be developed as residential, commercial or industrial, and each of these comes in two varieties, heavy and light.

The people in the new city, the Sims, will then start to develop these areas depending on various complex criteria, not least of which is that they require power, water and a road system.

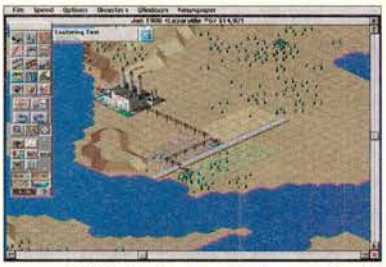
You also have control over the taxation levels for property. These can be set individually for the three types of zone and, in the case of industrial, you can even specify different levels of taxation for specific types of industry – these will influence their development, or lack of it.

There are three levels of zoom from which you can view the beautifully detailed game graphics – not only are the cars, trains and water supply animated but even the construction and demolition of each building.

As the view can get very complex, there are options to make buildings and/or roads disappear, plus you can view above or below ground, where you'll find the pipes and subway system. There's also a query option which allows you to interrogate specific objects to see what they are – for example, you can find out how busy the rail system is.

Unlike the earlier version, time now plays a real part in the development of your city. Different game items become available at different times. If you start in 1900 your transportation systems are limited to road, buses and rail, but as time goes on subways and motorways are added. The same applies to power stations which start with coal, oil and hydroelectric, then work up through nuclear, wind, microwave, solar and fusion.

There are extensive information windows that tell you everything you need to know about your city and how things are going. But you don't really need to know it. At the very simplest level you can switch on the auto-budget and just use the on-screen graph that says whether you should increase Residential, Commercial or Industrial zoning, and as long as you maintain the water supply and power, everything should move along nicely.



● *My basic plan for Lazarville #6*

Alternatively, you can dive in the whole way and control precisely which industries you want to develop, precisely how much will be spent on public utilities and so on. You can play it as deeply or as lightly as you want.

There are three further additions which add to the enjoyment. First are the special rewards. Every now and then your Sims will give you something for free – a house, a city hall, even a statue. Then there are the newspapers. These are randomly generated news reports, except they reflect what the Sims are thinking. For example, if your city is suffering from a lack of power you get headlines like *Mayor in the Dark* or *Brownouts cost business.*

Finally there are the neighbours. In SimCity 2000 there are three or four other cities developing around you and ➤

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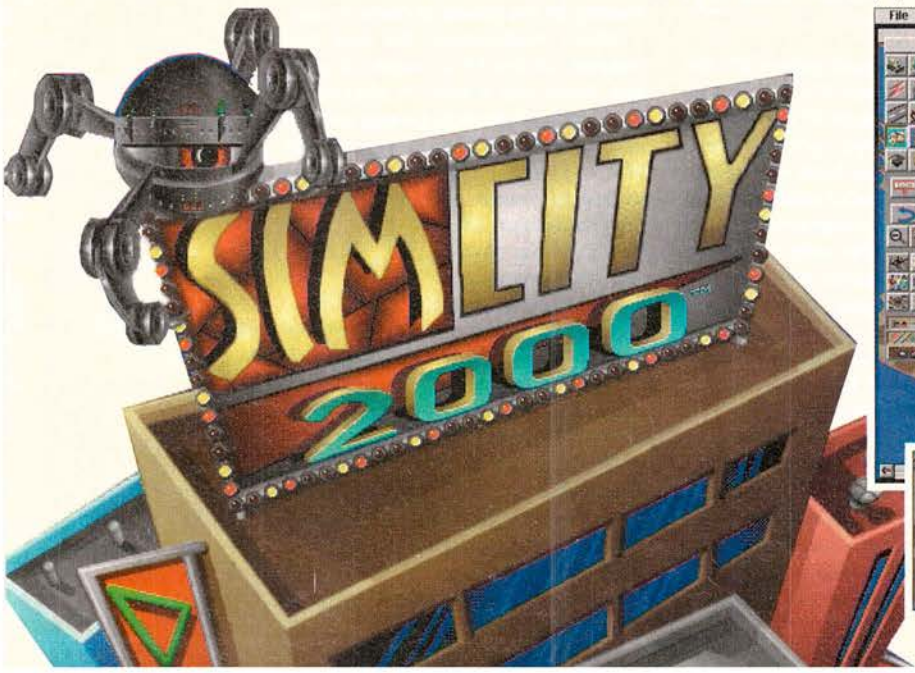


● *Build it fast and densely populated*

● *You cxan query any area of land*

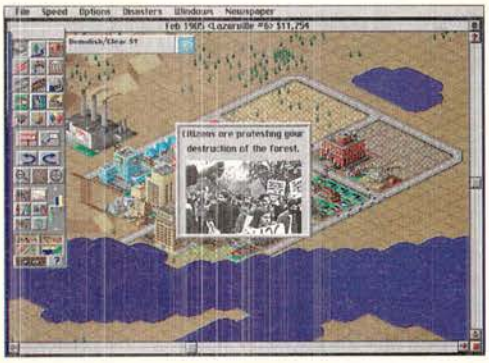
➤

you can see how they're doing using the neighbours window. All this does is give you a display of the population levels but it is useful, and more importantly, you can build road and rail lines to them which will increase your commerce and industry.

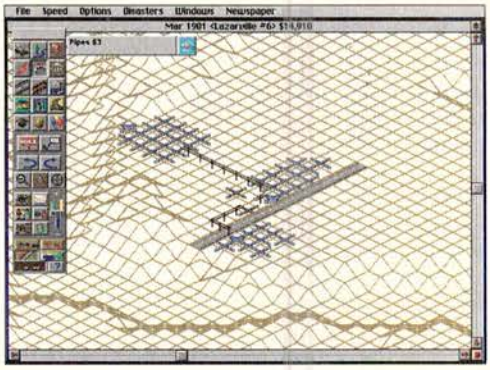
There is a new type of building that's also been added, although I never got to build one in Lazarville #5, and that's an Arcology. This is a massive building which contains its own residential, commercial and industrial zones within one self-contained unit. The manual warns that when you place one you must ensure it has extensive transportation links and a strong police presence nearby.

Finally there are the disasters. You can have these switched off completely but with them your city may, from time to time, be afflicted with a terrible happening. Earthquakes, floods, alien monsters, anything may strike down your city giving you more to worry about than whether the Lazarville Lions are going to win the league this year.

The manual for SimCity 2000 is large, very detailed and essential reading. There is a strong temptation to dive straight in but reading the manual first, and working through the tutorial section, is certainly to be recommended. I belong to the just-dive-in brigade but after a couple of failed cities I had to go back and discover what I was doing wrong.



● *Ooops, have to stop knocking down trees*



● *Sims like their buildings to have water*

SimCity 2000 is very educational as it forces you to step back from the detail of *who's living in this house* to the city-wide *if I knock down this house and put in a subway will it relieve the traffic congestion here?* Even my three-year-old liked seeing the houses and factories built and told me where to put in the roads and railways for the Sims to ride on, even if the monetary aspects were lost on her (thankfully).

There is also the terrain editor which allows the creation of specific formations, even copying the terrain of known cities.

A quick word about Lazarville #5. It started in 1900, never burned coal, oil or uranium, using hydroelectricity, then wind power and finally fusion, with some solar power thrown in when the first fusion plant blew up, oops. A high property tax on petroleum-based developments ensured that it never had excessive pollution. No income tax, no sales tax plus lots of social support – no wonder my people loved me.

Verdict: This game is dangerously addictive.

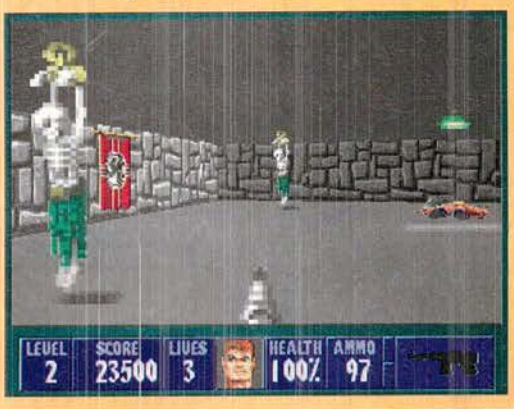
Lazarus

Wolfenstein 3D — update

...achtung!

WELL this is it, the full, six-level version of Wolfenstein 3D. The location: A Nazi dungeon. Your mission: Escape and carry out your original mission. Wolfenstein 3D pioneered (as far as games are concerned) the technique known as texture-mapping, which turns a bland 3D maze into a stone-built dungeon, or wood-panelled suite, or indeed anything you like.

As far as game concepts go it's not the most original, or the deepest. For comparison with Acorn games it's like Stryker's Run, except it's in 3D. You work your way through the dungeons, killing the bad guys, getting shot, picking up restoring food and useful ammunition, and occasionally more exciting weaponry.



You start with a gun that you acquired from the first guard you disposed of, but if you run out of ammunition you have to go back to the knife, which means closing in before the kill – dangerous when the opposition have nasty sub-machine guns.

Caution is certainly called for at all times. It's all too easy to miss an opening into another room, only to find yourself being shot in the back by the guard who was in it. And you have to keep searching for the secret passages which contain treasures, food and, possibly, other useful items.

● *Phew, it's only the lift*

It's also possible to develop tactics like poking your head around the door and opening it then stepping back and waiting for the guards to come to you.

When Wolfenstein 3D was first released on the PC a couple of years ago there was a rush of alternative levels and wall-textures created and put into the public domain. If you can get hold of these the Acorn version will do its best to convert and run with them. And the author, Eddie Edwards, has invited any bored programmer to produce a levels designer to run on the Acorn machines.

If you want a bit of fairly mind-less violence – perhaps as an antidote to the concentrated tactics of SimCity – you could do a lot worse than Wolfenstein 3D. You know you've been playing Wolfenstein 3D too long when you start to move your head to look round the corners.

Steve Turnbull

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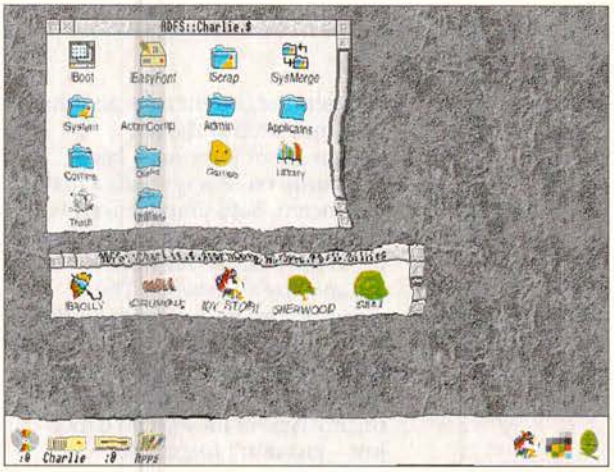


● *Too much punch or a copy of Dy-Stort*

Widening the spectrum

Teri Paul examines what shopping on Cheapside can bring

BOUNDARIES are always difficult to draw and the grey areas are getting even greyer, so what is PD? First of all the legal situation in this area is a tad shakey. Law is mostly based on *custom and practice*. Unfortunately, no one seems to have made a definitive decision on either.

However, the general consensus is that if you release something into the public domain you release all your rights to it. You give it away for people to do with as they please, you do not retain any rights over it and cannot say where it goes or who does what with it.

Enter a new term, Freeware. Here the author is not selling or expecting any money for a program but retains copyright. Finally, there is Shareware whereby you retain all copyright and if a user likes and uses the program you trust his innate honesty to register his use – with money.

As a rule of thumb, if a program does not say it is *Public Domain, Freeware* or *Shareware* then it is copyrighted. The same copyright rules apply to programs on a magazine disk as to the articles inside that magazine. If in doubt ask.

Silly season

Having introduced you to the desktop patrol last month, I thought it my duty to give them some more villains to arrest. I have chosen a handful for this season of goodwill, though I think that at least one is guaranteed to stretch that emotion to the full.

Brolly is rather a nice little program by Robert Brown. You can keep it sitting on the iconbar, closed and unused, or you could opt for some weather – snow, rain or lightning. Just open the brolly and the winter season will invade your desktop. **Crumble** is an annoying little colour mixer which follows the mouse, but at least this can be turned off via the Task Manager.

The same cannot be said for **Sherwood**. Back in the mists of time, Motorola proved a point concerning a crack in security to Xerox via a series of patches. These patches were incorporated into a pair of programs called Robin Hood and Friar Tuck. These were designed to run as *ghost jobs/demons*. A simple matter of deletion? Well, run Sherwood on your Acorn and you'll see the problem.

Try removing the programs from the Task Manager and you'll overhear this conversation: *Friar Tuck... I am under attack! Pray save me!* Fear not, friend Robin! I shall rout the Sheriff of Nottingham's men! *Thank you, my good fellow!*

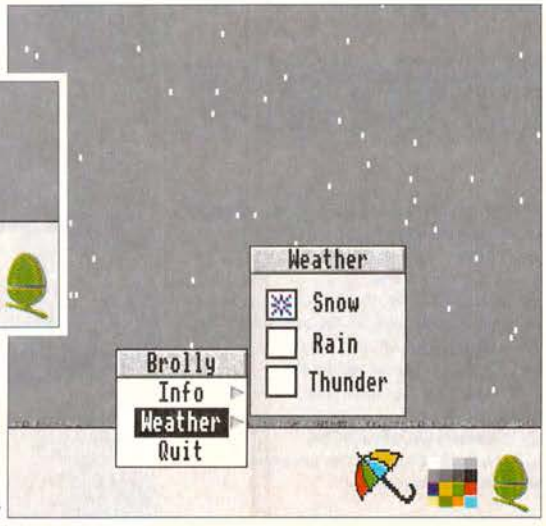
Each ghost-job detects the fact that the other had been killed and starts a new copy of the recently-slain program within a few milliseconds. The only way to kill both ghosts is to kill them simultaneously, achieved by closing down the system. I think Motorola proved their point.

The last two are pretty obvious. **Dy_Stort** from Tommaso Leddi in Milan is easier to turn off but can come as a severe shock to your eyes, whereas if you want to give your duck a holiday you could always load **Snail** as a replacement. Named Cyril, he will follow your pointer for hours and hours and ...

Do something useful...

There is not enough space this month for major applications, so here are a few useful bits and pieces well worth adding to your collection. Philip Macfarlane's **PretyFile** tidies up your filenames into a neat format with a mixture of upper/lower case letters and punctuation symbols. To convert a filename, drag the file on to the icon. Locked files are unchanged but you can drag in groups if you need to.

● *Meet Cyril*



● *Brr, looks like snow*

Alerter comes from Ian Rawlings and when a program is processor hogging, Alterter gives you a time indication that it has finished the process apart from normalising the cursor. You'll be beeped if anything causes it to wait for more than a certain number of centiseconds between WimpPolls. It sleeps for up to 50 centiseconds and then reads the monotic time. If the difference ➤

Sorry

Andrew Armstrong did an excellent job with StrongEd2 but didn't write either Grafitti or FontMGR2. Those laurels belong well and truly to Andrew Lindesay from Auckland.

● *Artfully creative*

between the current time and the time measured at the last measurement is greater – beep.

Security has always been a matter of concern. **Safe** simply encrypts and decrypts files which you drag on to the iconbar. All work is actioned by a password. The password can be entered from the menu and the option to conceal the word typed is provided by clicking on the *visible*. The program works on any type of file and no data is lost – just don't forget your password.

...something seasonal

For many people, Christmas without Raymond Briggs is not on. So if you can't get near your telly, take a gander at a certain program converted from an Atari ST PD demo called **The Snowman**. This has edited highlights of the story and the famous *Walking in the air* sans vocals. Brilliant.

There is a great deal of clipart – commercial and otherwise – for this commercial or all festive seasons. Many are scans and conversions from other platforms such as the collection from The NakedPD. These are in Tiff or PCX format and can be accessed via Translator or ChangeFSI and then saved and ported as sprite files. Always worthy of a mention is that they have checked the copyright status so you know you are dealing with PD graphics only.

However, top marks must go to Arch Angel for its **Christmas Pack**. This consists of seven disks of scanned images and also some really good drawfiles on Disk 3 entitled the Gnelf Christmas Clips Collection. These have been drawn and compiled by Richard Stubbs and contain a collection of cute, humourous and useful images. I have seen most of the sprite files before from different sources, but the Gnelf collection is less well known and has greater clarity.

There are some Christmas tracker tunes and demos in the collection which are worth a look at. However, for those with young children the Genesis application Christmas Customs has interesting facts and details about how and why Christmas and New Year is celebrated in different parts of the world. This is not comprehensive and it would be nice to see stories and legends from other countries included, such as those in Central and Eastern Europe as well as South

Featured this month

Alerter	Datafile
Christmas Clipart	NakedPD
Christmas Pack	Arch Angel
Crumble	Datafile
Brolly	Datafile
Dy-Stort	Datafile
PretyFile	Datafile
Safe	Datafile
Sherwood	Datafile
Snail	Datafile
Snowman	Datafile

PD LIBRARIES

8-BIT HOUSES

8-bit Software, 17 Lambert Park Road, Hedon, Hull, East Yorkshire HU12 8HF.
BBC PD, 18 Carlton Close, Blackrod, Bolton BL6 5DL.
HeadFirst PD, 97 Chester Road, Southport PR9 7HH.
JJF PD, 49 Hollyberry Close, Winyates Green, Redditch, Worcester B98 0QT.
Masterdisc, 2 Seaview, Hoylake L47 2DD.

32-BIT HOUSES

3PD Swapshop, 66e Picardy Road, Belvedere Kent DA17 5QN.
Alpine PD, PO Box 25, Portadown, Craigavon BT63 5UT.
APDL, 39 Knighton Park Road, Sydenham, London SE26 5RN.
Arcaynia, PO Box 1927, Sutton Coldfield B74 3QZ.
ArchAngel PD, PO Box 41, Exeter, Devon EX4 3EN.
Archimedes Fractal Group (AFG), 30 Bowen Drive, West Dulwich, London SE21 8PN.
ARMistic PDSL, 136 Wellesley Road, Ilford, Essex IG1 4LJ.
Australian RISC, 241 Hawkesbury Road, Winmalee NSW 2777 Australia.
Cheap PD, Greenways, Grubwood Lane, Cookham Dean, Maidenhead, Berkshire SL6 9UB.
Craig Beech PD, 30 The Deerings, Harpenden, Herts AL5 2PE.
Datafile, 71 Anson Road, Locking, Weston-Super-Mare, Avon BS24 7DQ.
Datastream, 34 Norbreck Close, Great Sankey, Warrington, Cheshire WA5 2SX.
Different Ideas, Eyton House, Eyton, Leominster, Herefordshire HR6 0AG.
Digital Phenomena, 104 Manners Road, Southsea, Portsmouth, Hampshire PO4 0BG.
DigiTech, 20 Downing Crescent, Bottesford, Scunthorpe, South Humberside DN16 3LS.
Eureka PD, 78 Rawlinson Road, Southport, Merseyside PR9 9NE.
Five Star Marketing, 4 Shepherds Walk, Bushley, Herts WD2 1LZ.
HeadFirst PD, 97 Chester Road, Southport PR9 7HH.
LowCost PD, 6 Furzeland House, Sheephouse Way, New Malden, Surrey KT3 5PH.
Lunchtime Disk Magazine, 203 London Road, Chesterton, Newcastle, Staffs ST5 7HF.
Moonlight Graphics, PO Box 3569, Cape Town 8000, South Africa.
Naked PD, Fayence, Fulford Road, Fulford, Stoke-on-Trent ST11 9QT.
Planet PD, 37 Manor Drive, Berrylands, Surbiton, Surrey KT5 8NF.
Skyfall, PO Box 2220, Birmingham B43 5RZ.
The ARM Club PD Library, 19 Woodberry Way, London N12 0HE
Westbourne Services, 34 Bradley Street, Wooton-under-Edge, Gloucester GL12 7AR.
Xi Software, 1 Avon Drive, Alderbury, Salisbury SP5 3TA

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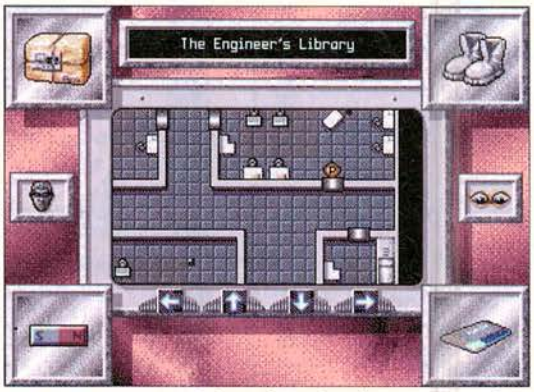
Journey into the unknown



● *Start investigating as you explore*

Graham Keeling travels into the future to learn about electricity and magnets

AN adventure game seems an unlikely place to find worksheets on electricity and magnetism but Sherston's Voyage of Discovery has put the two together with great skill. The software takes me back to the computer adventure games of 20 years ago. Some of us are actually old enough to remember wandering around strange environments searching for clues and objects to help us in our quest to slay the evil dragon.

It is the spirit of these early games that drives the plot of Voyage of Discovery, but now we have the graphic and sound power of the Acorn computer and a National Curriculum that demands the teaching of Magnetism and Electricity. These two together have resulted in a real gem of an education package for children aged between 9 and 13.

PRODUCT SPOTLIGHT

Product: Voyage of Discovery
Price: £31.95
Supplier: Sherston Software, Angel House, Sherston, Malmesbury, Wiltshire SN16 0LH.
Tel: 0666 840433

The plot of the story demands that the children at the computer enter a future world where they must deliver a parcel to a space craft captain. A superb animated introduction sets the scene and soon they will become totally immersed in the world of the space craft Discovery.

Text is important within the adventure as the children need to respond to written instructions and information given on the screen. Complex ideas are dealt with in a clear, simple manner. The writers of this software have obviously spent a great deal of time and effort into making the learning situation as clear as possible. If only this were the view of the central character in the story, one Boris robot. He can be of help when he chooses. Luckily, games can be saved and the children can then pick up where they left off. This is a great help as Boris is not going to let anyone go through this adventure easily.

Electricity and Magnetism are the aspects of science which the program attempts to clarify for the children. As they move around using maps and animated sequences, they are expected to solve various problems. These are all preceded by helpful *videos* on the particular aspect of magnetism or electricity involved. On-screen maps are quite detailed, showing only a small area of the space craft. This is not a problem as full maps are included in the resources.

Voyage of Discovery is not intended to be used in isolation but as part of a scientific topic. It does not replace the practical experience of experimenting with bulbs, wire and batteries, but at least the experiments on the screen work. This may seem a lame point, but my own experience of children investigating with electricity leads me to believe that their prime motive in any activity is to see how many batteries are needed to blow a bulb.

Add to this poor connections, bits of sticky tape stuck to batteries, and drawing pins that refuse to stay in place and one has the perfect recipe for children learning very little at all apart from the diagrams which they copy from the board. Learning by experience is great but if it involves batteries, wires and bulbs, something else is required to make sure the correct facts get home.

Voyage of Discovery does just this with an exciting plot line, informative *video* sequences and tests to check the children's understanding. It is a fine attempt to help teachers with a difficult subject. As they move around the spacecraft the children will learn about magnetic objects, poles, compasses, circuits, switches, fuses, electrical symbols and electromagnets, to name but a few.

What really impressed me was the reality of the tests – magnets really seem to repel and attract, bulbs really do light up. All these activities can be reproduced in the classroom, indeed I would strongly suggest that they were. But the ones on the screen work and in my classroom they often didn't.

Voyage of Discovery comes on three disks, with an extra resource disk full of graphics from the program. These can all be copied apart from the start up disk which must be in the computer when you begin the program. This is to allow Sherston's excellent approval scheme which I would strongly recommend to other software houses.

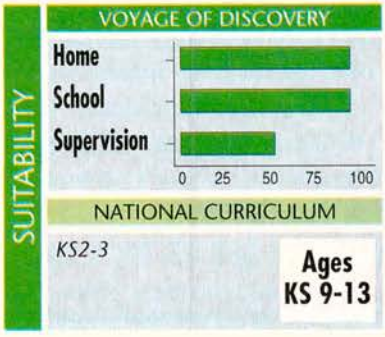
Photocopiable activity and assessment cards are of the high standard we have come to expect from Sherston, while the two challenge cards may be considered a little difficult for some KS2 children. Maps of the spacecraft complete this impressive package.

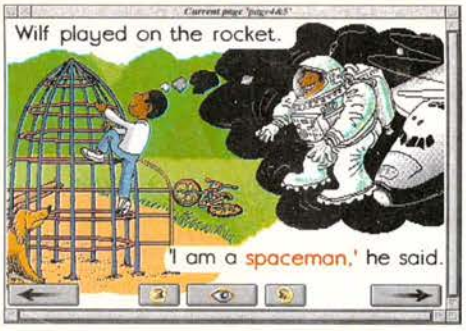
Summing up

Voyage of Discovery is a brave attempt to make an exciting but difficult subject more accessible to children and easier to manage for teachers. I am concerned that some children will end up simply wandering around the spacecraft getting nowhere, but a useful page in the simple manual will allow the teacher to steer them in the right direction for the next tasks.

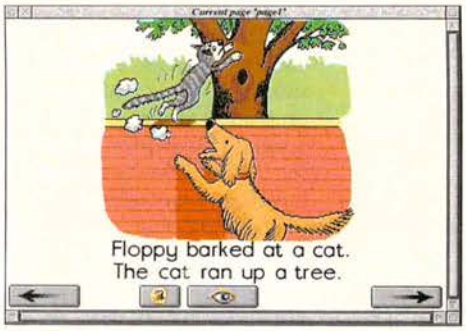
It is possible to save positions and to start groups at any point of the adventure. Like many of these adventures, it is not the final solution which is important but the facts and skills learned upon the way. Voyage of Discovery is a fine package which uses the best of old ideas and new technology to enhance the child's learning environment.

There is some superb science teaching going on in our primary and secondary schools, despite what some members of the government would have us believe. This new package from Sherston will serve to show what can be done when technology is allowed to assist teachers in the class room.





● *Animations and sound work with the words*



● *A Cat in the Tree is a favourite*

● *Children need little supervision with these*

The joy of reading

Frank Jukes examines how one package encourages pre and early readers

ANYONE who has seen Sherston's delightful Naughty Stories series will immediately recognise the pedigree of the Oxford Reading Tree Stage 3 Talking Stories and can look forward to seeing (and hearing) them. Supplied on six disks, with one story on each, the stories are disk-based versions of the popular Reading Tree books *Nobody Wanted to Play, On the Sand, The Dolphin Pool, By the Stream, The Rope Swing* and *A Cat in the Tree*. Each book contains exactly the same text and pictures as the paper-based originals with some extra practice on keywords added.

In addition to the text and picture, each page contains up to five extra-large icons whose roles are quite clear. Left and right pointing arrows move to the previous and next page, an eye produces animation and sound effects and an ear elicits the reading of a sentence. To keep things really simple on pages with two sentences, a second ear will only appear when the first sentence has been read.

As an alternative to hearing the story read a sentence at a time, it is possible to either turn the facility off and hear words only when they are clicked on, or to have the book read automatically at either a fast or slow speed. The facility to turn off automatic reading is ideal for developing readers who may need some help with just the odd word.

Useful as this is in terms of simple and immediate support for the reader, Sherston has gone a stage further and allowed a record of the words clicked on to be stored as a log file, or printed by dragging it on to the printer driver icon on the iconbar. By checking this it is possible for the teacher to identify difficulties which a reader may be encountering. In typically thorough Sherston fashion, help for the teacher does not end there and further flexibility is available.

For readers who are identified as needing extra help with reading certain key words, an index of pages offering such additional practice is available from the final page or a central menu, along with the facility to print the current page if a printer driver is loaded. Finally, it is possible to either change the colour used to highlight words as they are read or even remove it altogether, as well as alter the volume at which the stories are read.

With a title like Talking Stories it is obvious that the quality of sound will play an important part in the presentation of the stories. The voice used in reading them is expressive, clear and gentle in tone, while the sounds associated with the animations are similarly clear and always very apposite. The animations themselves add some fun to the story without directing the reader's imaginative response too much.

Moving from page to page is a fairly speedy affair when working with the original floppy disk, but it can be a little slow for an eager young reader, especially when long sound samples or complicated animations are involved. It can, though, be speeded up considerably by installing the stories on a hard disk and running them from there. The original disk must, however, be present in the machine when the stories are used as the protection system requires it for verification.

Although aimed at users of the Oxford Reading Tree series, these Talking Stories work well by themselves or in conjunction with other published schemes. Used with small groups of up to three – more than that and there is the opportunity for some children to become passengers rather than active participants – and with adult help as appropriate, they are a useful resource to provide extra practice at their particular level.

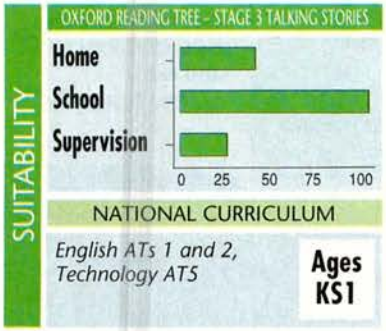
As well as providing extra practice, the stories also offer a source of motivation for children who are finding reading a problem. The joy of a bright and interesting page allied with speech, sound effects and animations provides lots of encouragement to help overcome the worries and problems of a reluctant reader.

Summing up

Without exception, children using these stories are entranced. They find them easy to use and thoroughly enjoy being in control. To try a word and then be able to click on it and receive immediate confirmation of the attempt without any hint of disapproval when things go wrong is just what young readers need. Beyond that is the simple pleasure of hearing a story and being able to interact with it. I can only imagine that this will be another winner from Sherston.

PRODUCT SPOTLIGHT

Product: Oxford Reading Tree – Stage 3 Talking Stories
Price: £39.95
Supplier: Sherston Software, Angel House, Sherston, Malmesbury, Wiltshire SN16 0LH.
Tel: 0666 840433



Over the hill and far away

Frank Jukes dons his walking boots and sets off along the Langdale Valley

LANGDALE is one of many beautiful valleys in the Lake District and offers a host of opportunities for the study of a whole variety of geographical topics. It is with this in mind that Creative Curriculum Software has created its very impressive Langdale CD.

The CD is a massive resource extending to over 100Mb with in excess of 500 files containing photographs, OS maps, text, CSV data, sound samples and diagrams in the standard Acorn formats. In fact there are so many that not all of them were able to be used in the applications on the CD.

Langdale itself is the first of the applications and is designed to provide an overview of the whole package. Containing background information on the Lake District, it shows how the high quality pictorial and written resources are used to support studies on river profiles, flood risks, land forms and land use.

Two further brief applications, Guide and Geology, provide a useful summary of the resources on the CD and give general information about the rocks of the valley and how they were formed.

The remaining applications offer simulated walks or investigations. Stickle, Blisco and Bowfell are three simulated walks all of which start from the New Dungeon Gill Hotel Car Park. Their main use is to support investigations into land forms with Stickle offering a hanging corrie, while Blisco and Bow Fell offer extensive panoramas of the upper section of the valley and climatic and environmental changes respectively.

B8o
Harrison Stickle
Pike Howe
Pavey Ark
Scout Crag
Tree Plantation
text80
This view is taken from just behind the New Dungeon Gill Hotel looking in a north westerly direction. The high hill to the left of the photograph is Pike Howe. In the distance you can just make out Harrison Stickle and Pavey Ark, the steep cliffs that surround Stickle Tarn. In the foreground there is more planting of trees which hide the human activities within the natural landscape.
FB
P

● *Map, graphic and text help you find your bearings*

Each of the walks is based on a series of scanned sections of the relevant OS map on to which selected locations or *hot spots* have been superimposed. By clicking on a hot spot a list of photographs or a single photograph is revealed. These are all high quality and have been carefully chosen to show the view from that position or to illustrate a particular teaching point. For those who might wish to visit the area or simply want to improve their map reading skills, a grid reference and bearing is provided for each photograph throughout each of the applications.

Also available at each of these locations, and accessed by simply clicking on icons, is extra information such as descriptions of what can be seen, enlargements of sections of the photographs, overlaid labels or sound samples.

River offers the opportunity to undertake river profile and flood risk investigations. It covers the whole of the valley from Mickleden to Elterwater and is built around a very extensive collection of photographs. These are used to good effect in illustrating the changes to be found along the river's course and are helped by very clear explanations of what is to be seen.

The last of the applications, Land Use, is used to support an investigation into the ways we humans have been able to make use of Langdale. With plenty of authentic sound samples and files holding extra information such as bus timetables, this section is well resourced. The effect is to make absolutely clear not only the ways in which humans have used the valley but the ways in which the valley has constrained what those humans have tried to do. One particular frame, taken close to Stool End Farm with the sound of the wind whistling past, makes the point all too well.

For those who do not need the whole package, or do not yet have CD-Rom, Creative Curriculum Software has gone to the trouble of making the River Project and the Stickle Tarn Project available on disk.

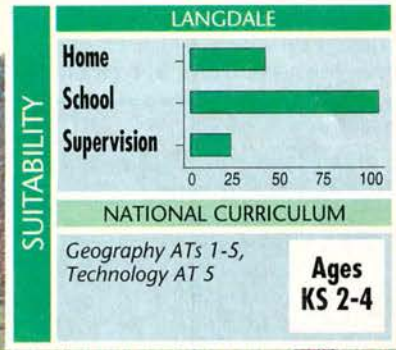
In a similarly helpful vein, the package also includes additional paper and disk-based resources as well as files which make the package accessible, via a concept board, to those with special needs.

Summing up

Langdale is an exceptionally well-resourced yet compact package with potential far beyond the classroom. The simulated investigations are clearly thought out and make their point well, with plenty of individualised work available at the same time. The quality, number and variety of the photographs it contains, as well as the support materials, make Langdale well worth considering for use at Key Stage 2 and beyond.

PRODUCT SPOTLIGHT

Product: Langdale
Price: £149 – Stickle Project or River Project only (disk) £49 each
Supplier: Creative Curriculum Software, 5 Clover Hill Road, Halifax HX1 2YG.
Tel: 0422 340524
Requirements: CD-Rom drive for full package, minimum 2Mb ram



A little mouse with clogs on

Discovering Holland can be a whole new experience – Graham Keeling reports

AFTER Explore with Flossy the Frog, we have all been waiting to see exactly what Mike Matson and friends would dream up for their winning format of interactive screens. Frankly, I expected simply more Flossy, but the 4Mation team has given us A Mouse in Holland which is a step further down the road in more than one sense, with the most charming opening pieces of music ever to be written for Acorn computer software coupled with screens which use both drawn and scanned images.

Martin Mouse is Dutch and the children are invited to explore Holland with him, looking for cheese, fruit and moles. This simple task may help to focus the minds of some children but the superb animations and sound effects should be enough to captivate any child or adult. There is a text window at the bottom of the screen but the ability to read is not essential to enjoy the package.

Created by Hans Rijnen and Mike Matson, A Mouse in Holland provides an introduction to the Netherlands with a real Dutch feel to the program being given by the music and authentic scenes of windmills and canals.

Children wander around these screens but have to learn their way about as they interconnect in unusual ways. From the windmill we can go to the bathroom by clicking on one of the windmill's windows. Access to the tunnel is via a mole hill, and a cow takes us to the kitchen. Using Select on an object usually elicits a response of animation and sound while using Adjust often gives us a piece of written information especially relevant to the Dutch theme.

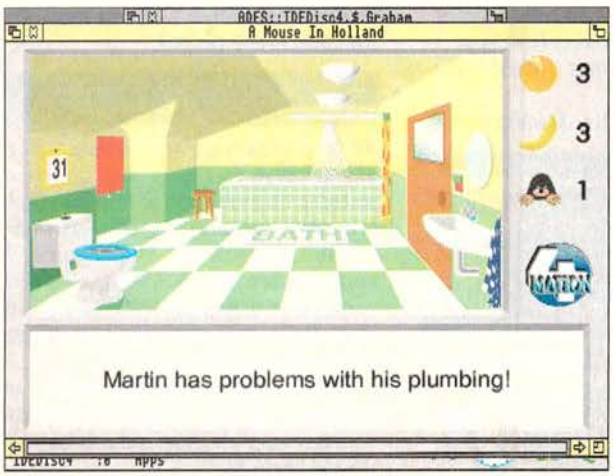
Scenes to visit include a museum where old masters can be viewed and animated in most surprising ways, a busy street where litter and letters have a lot to do with how we move on, and a canal scene where some incontinent sea gulls could simply ruin your day.

The whole package is crammed with stimulation for the imagination. Surreal vegetables dance with some really strange fruits while the character of Martin Mouse attempts to bring a level of sanity to each screen as he moves around. It is possible to save a position at any time, so children can hold on to their collection of trophies without having to collect them afresh every time they play the game.

Obviously aimed at the younger children in our primary schools, I could see many older children getting a great deal from the package, especially if they were engaged in a topic on European countries. I doubt that A Mouse in Holland would be happily recommended by the DfE for children studying an EEC country for Level 5 Geography, but I have a strong impression that they would gain a deeper understanding of things Dutch than they would by studying any number of *interesting* library books on the subject.

The adult's reference book is a slim volume with a crib sheet on where to go to get from scene to scene, along with information on where to find the cheese, fruit and moles within the game aspect of the program. I strongly recommend that teachers do not use this information as they will then be denied the pure joy of the unexpected as they wander around the scenes.

The second half of the reference book includes questions about Holland which can be answered by children who have taken note of the information within the program. Other questions are designed to stimulate the imagination while a final section includes a glossary of Dutch words and some information about the Netherlands for hard pressed adults or inquisitive children.



● *Try your hand at a little DIY*

Summing up

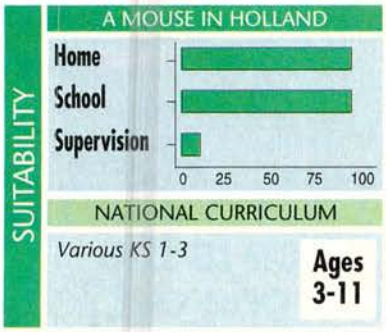
An enhanced version is available for RISC PC machines as well as A3020/A4000/A4/A5000 with a maximum of 2Mb of memory and a multiscan, VGA, SVGA or LCD monitor. Basically, if you can get Mode 21 or 28 the enhanced version is for you and will turn very good graphics into something quite exceptional.

A Mouse in Holland is a real joy to investigate, giving children an insight into the Netherlands while entertaining and stimulating their imaginations.

Its use could well be justified in both KS1 and 2 while there are quite a few KS3 children who would have a whale of a time and learn a great deal from such fascinating software.

PRODUCT SPOTLIGHT

Product: A Mouse in Holland
Price: £29.50
Supplier: 4Mation, 14 Castle Park Road, Barnstaple, Devon EX32 8PA.
Tel: 01271 25353



Jump on the Playbus

From TV to computer – how does Playdays translate? Geoff Love investigates

I HAVE to admit to having a soft spot for Why Bird and the Playdays team. They have always felt in the same mould as my childhood memories of Play School, Big Ted, Hamble. Ah, nostalgia ... But back to the point. You've seen the TV programme, now buy the computer program. Playdays is a new piece of software aimed at Key Stage 1 and earlier. It contains 13 games which aim to develop a number of basic skills and concepts including Maths and English.

On loading the game, Why Bird invites you to give her your name. As is the same throughout the package this is not typed in from the keyboard in the conventional fashion. If configured for mouse input you simply click on letters from a list and select the tick symbol when finished. If keyboard input has been chosen the cursor keys are used to negotiate the same letter list, with the space bar used to confirm a choice. You are also asked to select a level from one to four. This chooses the difficulty level at which the tasks are entered.

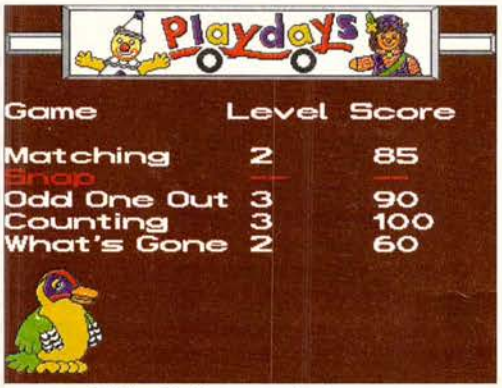
Rather cleverly, if you enter the game at an easy level and appear to be getting on rather well the software will automatically increase the difficulty of the challenges – there's no slacking allowed here.

The final stage before getting started is to enter a letter. Most games are based around a set of 12 words. Six of these begin with the same initial letter while the other six are selected from other letter choice lists. Selecting the letter chooses the word selection. The exception to this is the letter X which will be explained shortly.

Some cute animations and music lead into each game. The 13 games cover areas such as *counting* – count the number of objects shown, *spelling* – spell the names of the pictures shown from a selection of letters – and *odd-one-out* – choose the odd one out from a number of pictures/words. These games use some 250 words and pictures in all and involve the children using a wide variety of skills.

The on-screen instructions for each game are minimal by design and generally children soon saw what they had to. One game which did cause some initial confusion was the matching game where words had to be matched to pictures. The mechanism for actually selecting words and pictures is a little confusing at first, and this is exacerbated by the fact that you cannot undo a choice once it has been made.

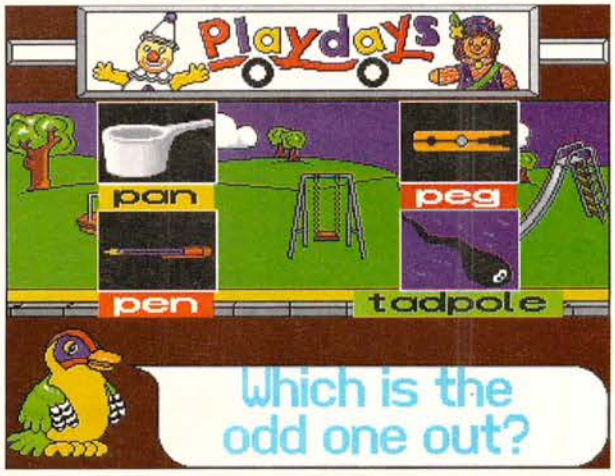
In addition to the 10 *normal* games there are three *X* games. If you're thinking, like I did, that this was a cop-out for not being able to think of enough words beginning with *x* to make a normal game, then you could have a point! In fact though, the three X games are useful in their own right: *Noughts and Crosses* where you play against the machine, *Treasure*, a logic activity to find the hidden treasure and *Shapes and Colours* which is a matching exercise. A progress chart is displayed which gives a rating for each game played.



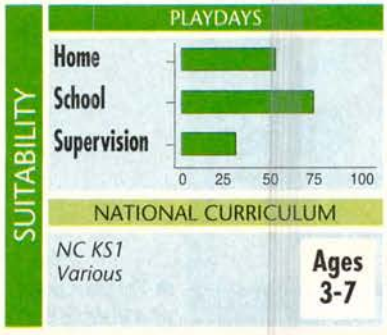
● *Why Bird keeps a check on your progress*

PRODUCT SPOTLIGHT

Product: Playdays
Price: £25.99
Supplier: SkillsWare, Worthy House, High Street, Hamble, Hants SO31 4HA.
Tel: 01703 456523



● *Playdays uses simple screen instructions*



Summing up

All the graphics are simple, clear and effective and there is good use of sound and animation as the inevitable reward for getting the answers right.

The purpose of each game is clearly described together with National Curriculum references and the way in which each game is affected by the different difficulty levels.

If you need a package which can deliver a variety of activities to the younger user Playdays should be near the top of the list.

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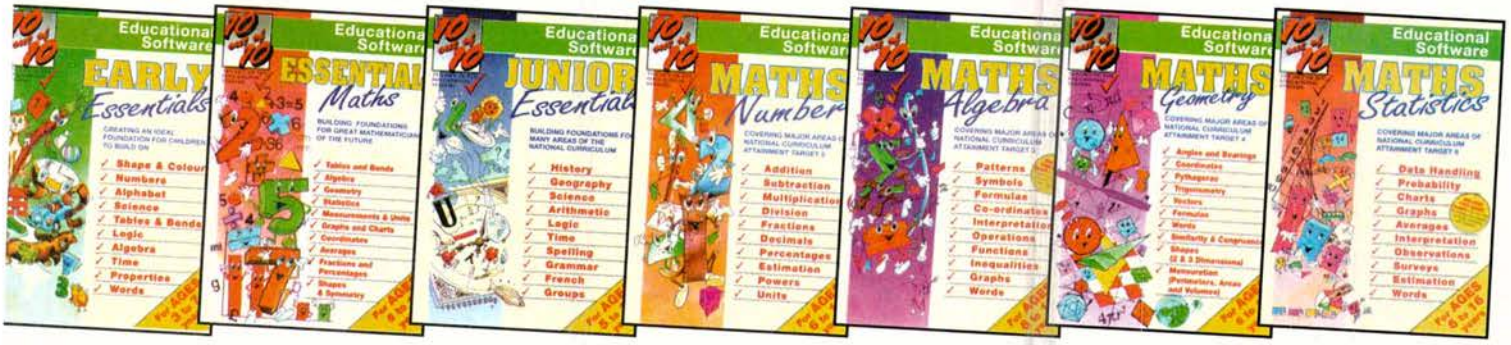

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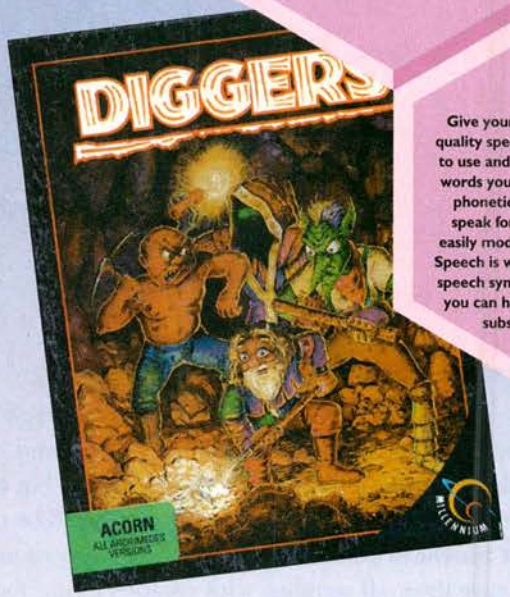

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Going, going, gone

Mike Cook answers another selection of your problems

Q I RECENTLY purchased a BBC Master Compact with an Advanced Teletext Receiver and a BBC LV Rom player made by Phillips for the grand total of £8 at an auction. I also own a BBC B+, a Macintosh Classic II and Risc PC 600.

The LV Rom player seems to be in working order but it came without its remote control instructions and any leads and the machine appears to be completely controlled by the remote control. It has a SCSI port and I would like to attach it to my Mac.

The Master seems doesn't seem to work, but I cannot be sure of this since I have no monitor so am attempting to run it on a TV. Can I use the Wordwise rom from the Master in the BBC B+?

Samuel Atcheson, Strabane, County Tyrone

A *Well, I can say that for £8 you certainly haven't been done. You can try to contact Phillips (081-580 6633) about getting a remote controller but it is likely that they don't supply them any more. Alternatively, if you can find someone with one, you can use one of the new universal remote controllers that can learn the commands from others. What it does is record the flashes from the original controller. Most of the LC rom players went to schools and colleges, so start asking there.*

As to the Master, it can drive a TV set and if you can get any sort of output at all the computer is working. What might be faulty is the UHF modulator. You can get a replacement for about £10, but do try it on a monitor first just to make sure.

The BBC B+ is a bit of a strange machine and not many were made, therefore not many ended up in the hands of developers. I have heard of several products that do not function and it is mainly in the filing system area that the problems arise. Having said that, I do not know if Wordwise *will work. However, as it is the later version that works on the Master it stands a good chance of working in the slightly older machine.*

Projected advice

Q I HAVE recently started a science project and hope to control some of the equipment from my A3010 – with 2Mb of ram but no hard disk. It will mainly involve switching motors or LEDs on and off and receiving information from sensors.

I have never attempted to control anything from a computer before and I'm at a bit of a loss. Should I use the parallel or serial port to link up the equipment to the computer? Will I need a separate power supply or will the computer output be high enough for my needs? Is there a limit to the voltage I can pump into the computer from the sensor and could I blow up my computer?

Once I've managed to make the connection I'll need to be able to send and receive information. A simple signal – on or off – would be enough, although a varying current may be useful especially when receiving analogue data. I've been programming in Basic for several years and can even cope with a little ARM code. Could you give me some pointers and some books which I could refer to?

Russell Palmer, Stourbridge, West Midlands

A *The best source for this sort of information is my own Body Building column. If you send in an SAE I can give you a list of all the past articles. You can obtain reprints of any of them for £1 each. One day I must get round to writing the definitive book.*

In the meantime, you really have to know exactly what you want to do before you can specify the best hardware and interface. There is a limit to the amount of power you can pump into a computer – try pushing anything more than five volts into it and you

➤

AGENDA

- LV roms
- Connecting disk drives
- Stronger casing
- Motor switching
- Stepping motors
- Decoding morse
- SWI calls

Connectivity

Q I MAY be a bit old fashioned with my machine but I like it. I have a BBC Master Compact. I was given a second disk drive which I have fitted into the case so that I have two disk drives side-by-side. Could you tell me where I can obtain the correct wiring figure to link up both disk drives?

J. Barton, Frinton-on-Sea, Essex

A *Connecting two disk drives together on the 8-bit machines is very easy. All you need is another insulation displacement connector clamped on to the connection ribbon cable. If the existing cable is not long enough then you will have to get a longer piece and clamp a new set of connectors to it. In other words, all the connections are in parallel between the two drives.*

Then you will have to give each drive its own identity, This is done by setting links on the disk drive electronics itself, The physical detail changes from drive to drive but normally it consists of a shorting link and pins. Make sure each drive has a different number link made – this would normally be the links numbered 0 and 1, although with some it may be marked 1 and 2.

Finally, you might find the drives have a terminating resistor pack on each of them. The rule is that the drive on the end of the cable must be the one with the terminator fitted and it should be removed from the other drive.

➤

will kill it stone dead.

The computer will only send and accept digital signals – on and off signals. If you want anything else you will have to add a D/A (Digital to Analogue) or A/D converter (Analogue to Digital). In general, these will only cover the range 0 to 5 volts but you can get amplifiers and attenuators to bash your signal up or down to size.

As to software, because Acorn computers are fast, most jobs can be tackled in Basic – you only have to resort to machine code for very fast processing.

You can write to Mike Cook c/o Acorn Computing, Media House, Adlington Park, Macclesfield SK10 4NP, or e-mail to acorncomputing@cix.compulink.co.uk

He will answer any questions about difficulties you may be having with your machines, mainly those to do with hardware. If you want a personal reply ensure that you enclose an SAE with your letter.

Stepping in time

Q WE wish to link a BBC Model B to a stepping motor. I have been told that there is a Body Building Kit available to do this. Can you let me have any further information?

M.S. Lloyd, Lydbrook, Gloucestershire

A *I have covered an interfacing stepping motor in two articles. The first dealt with a four-phase motor and was in the May '84 issue of* The Micro User. *The second dealt with two-phase motors and was more recent, being in the July '93 issue of* Acorn Computing.

The May article showed two methods of driving the motor. The FET driver for the four-phase circuit is still available at £6 but unfortunately they have stopped making the four-phase pattern generator chip. The two-phase chips in the more recent article are still available at £12.50.

Connectivity

Q I AM interested in connecting my Archimedes A310 – upgraded to 4Mb ram with 20Mb hard disk – to my AR3000A receiver. In particular I would like to be able to decode morse off the radio and print it to the screen or printer.

I recently wrote to AOR (UK) near Derby who gave me some information. Unfortunately, the software they could help me with means having an IBM machine running Windows. My computer can run a PC Emulator but is reduced to 640k of memory. Can you shed any light on what I am trying to do?

P. O'Hagan, Moreton, Merseyside

A *Decoding of morse was covered in the Body Building Articles in January and February 1993. For a reprint, send £1 to Musbury Consultants, 5 Helmshore Road, Haslingden, Lancashire BB4 4BG.*

SWI calling

Q I HAVE an A440/1 fitted with four podules including an external IDE drive. Every time I boot up the machine and open the directory window of the ST506 drive I get the error *SWI not known*. The message appears at the end of the access activity and the ST506 windows then open and everything works fine.

Further access to the drive is then error free. Following the error message, any attempt to find how much space is left on the IDE drive produces *SWI not known*. Access, however, is not compromised. If any filing errors occur – such as locked files – the SWI error appears.

Strangely enough these errors do not occur if the ST506 is not accessed.

I have opened the computer, pressed everything that could be pressed, cleaned the fan filter and changed the CMOS batteries.

Malcolm Brooke, BFPO

A *SWIs are really machine code routines that are accessed as if they were machine code instructions. Using an ARM-based computer, these are mainly implemented by relocatable modules.*

What is happening is that when your computer fires up it executes a number of instructions held in the !Boot file on the desktop and any other applications that happen to be there. It appears that a module is not being loaded or one is being killed or has been unplugged. When that SWI comes to be used it is no longer available.

What you need to do is to get to the command line (press F12) and type: Unplug. *If there is a list of modules that are unplugged you need to* RMReInit *them. If that does not work then put all your applications in folders – not at the top level of the directory. Then examine the !Boot file using !Edit and comment out the commands with a | symbol.*

Do this one at a time, starting at the bottom of the file, saving the file and restarting the computer each time. When you get to the stage where you do not get the error then you know what was trying to be done and can see if any pre-loadable modules are present. Finally, I should give the computer a quick virus check as this is the sort of thing you can get with a virus infection.

Monitoring assistance

Q AS you have been of assistance to me in the past, I feel that my recent experience could be of help to what must be many owners of early A3000 computers. My 1991 machine had a standard Acorn AKF18 monitor but of late I found the upper case section – on the left-hand side by the power supply – had started to bulge out from the bottom section. This was caused by the weight of the monitor supported by the Acorn stand only on the extreme edges of the case.

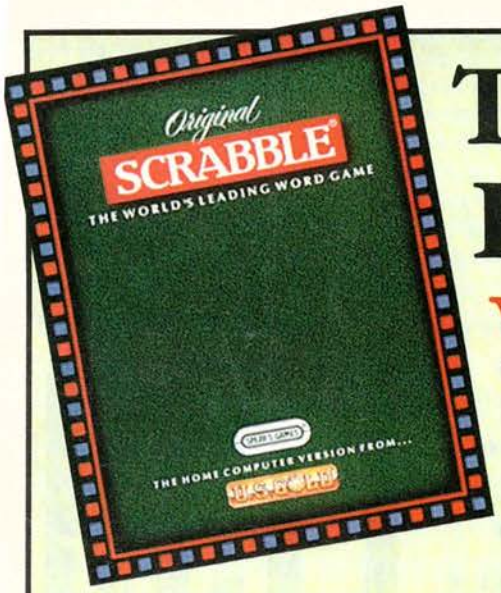
In my job as a school IT technician I have removed countless covers for a variety of reasons and have noticed that there have been two upgrades on these cases. One of these had special strengthening and interlocking around this area.

The latest Mk 3 upper and lower case sections – which Norwich Computer Services can supply – was the final one, but would the top section fit an early bottom and would it offer extra strength? The answer is yes. Although extra stiffening was made to the bottom case, the top section has a series of tongues which lock on to the bottom section and stop it from bulging. The original case only had a rebate joining the two sections which did not stop the top overriding the bottom with the monitor weight – maybe helped by the warmth of the power supply – as this doesn't occur on the disk drive end.

I did consider using both the cases but Acorn fitted a metal-cased power supply at a later date and the ventilation grooves in the bottom of the case under the power supply were stopped. The other reason was that I had gained enough strength with the new top and it is always best not to disturb the main circuit board unnecessarily.

K.R. Coron, Solihull, West Midlands

A *Thanks for the help. There is a lot of experience out there that could be of use to others and we are always willing to pass it on.*



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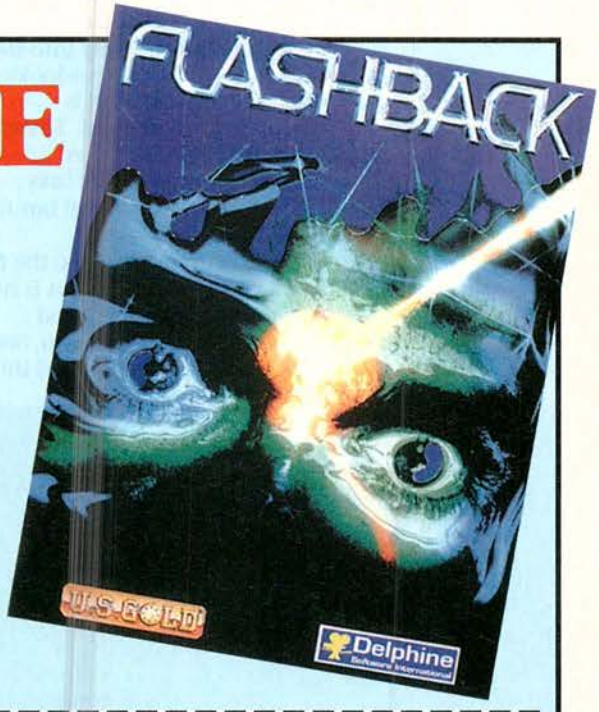

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Feel

Mike Cook exhibits his magic touch with this month's project

SOME projects just don't turn out how you expect them to – this is one of those. It's the sort that sounds quite simple but for one reason or another it isn't. I set out to make a touch screen for our computer, and indeed that's what I produced, but it appears to have other uses as we shall see.

On the face of it, the design of a touch screen is simple. All you need are several infra-red beams across the front of the screen so that whenever you touch the screen you break one of the beams. Simply detect which beam is broken and you know where abouts the screen was touched. However, within that simple remit is a lot of design and construction, not only because of the number of components in the system but also because of trying to minimise the hardware required.

Most commercial touch screens are built into the monitor, with the infra red emitters and detectors moulded unobtrusively into the case. In fact, the opaque-looking plastic of the surround is transparent to infra red. There is another system that uses transparent conducting inks painted on to the screen, but that's not possible in a home-construction situation. So the first thing we have to work out is how to mount the detectors and emitters close to the screen. Some screens are slightly recessed into the case and this makes things difficult.

I decided to mount my components on a frame made of angle aluminium – it was an asymmetrical piece with the two sides being 1 foot by 2.5 feet. I made the frame so that the monitor would push in the back of the it, forming a snug fit. The weight of the monitor should then hold the frame in place. The first snag here is that my monitor, while looking quite square, is full of subtle angles. I used the technique of holding the pieces against the monitor and marking them up before cutting and drilling them – I didn't use anything more fancy than a saw and a drill – and the whole thing is held together by four BA nuts and bolts.

The electronics

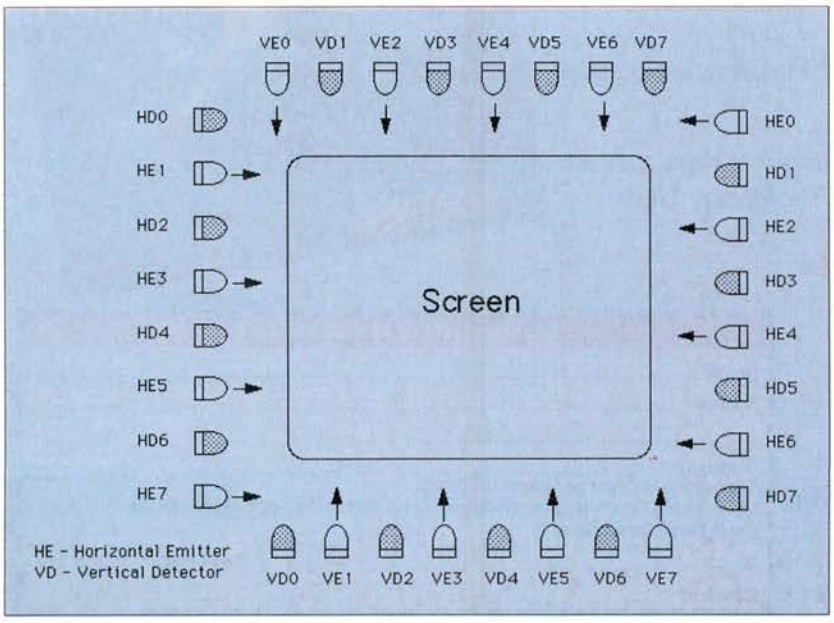
Having constructed a mount for the components, now came the time to design the electronics. The first problem was knowing how far apart I could put the beams. Too far apart and there would not be much resolution, too close together and the light from one beam would spread out and interfere with the next detector.

I tackled this on three fronts. First of all I scoured the component catalogues for a narrow-angled infra-red emitter. I found one in the OP298B – this has a half-angle beam width of 25 degrees and a high light output, 4.8mW at 100mA. A matching detector BPV11F was found with a half-angle of 30 degrees. This is a photo-transistor and has enough sensitivity to detect the beam without needing further amplification, furthermore it has a built-in filter to minimise interference from visible light.

In order to reduce the stray light further, I then fitted tubes over the emitters and detectors. I made these from black art paper rolled twice round a pencil so that they were the same diameter as the sensor. The ends of the roll were fixed with a little double-sided sticky tape.

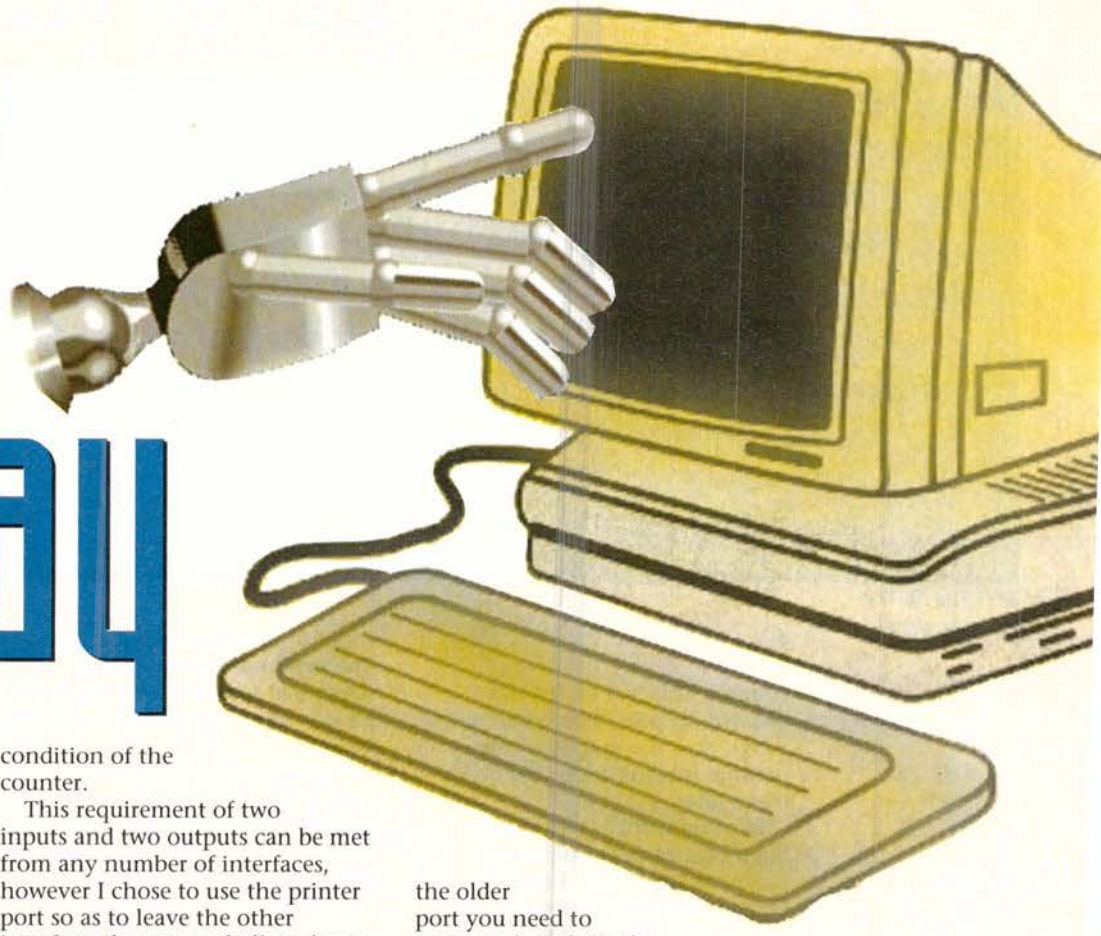
The final way to reduce the effects on adjacent sensors is to alternate sensor and emitter – in this way the sensors can be twice as close as if you had a row of emitters and a row of sensors. This sounds quite complex but is quite simple, and the basic idea is shown in Figure I.

Note that the screen is surrounded on all four sides with emitters and sensors, each column is labelled V for vertical and each row H for horizontal. I managed to squeeze eight beams in each direction but this can be modified for your convenience. Still having eight sensors enabled me to split the screen into 64 different sensing areas, more than enough



● *Figure I: The basic arrangement of the touch screen*

your way



for most projects.

Now when it comes to the interface, you can usually trade extra hardware for computer input and outputs and this is no exception. On the face of it, having 16 emitters and 16 detectors would require 32 computer I/O lines – my design reduces this to four. I could have gone for three but that would have needed much more logic circuitry and not have been worth while. So how is this trick performed?

The secret ingredient

Well, if you switch the emitters on one at a time you only need to see if any of the detectors has seen a beam. This is because if you know what light is on there is only one detector that can possibly have seen it. In fact in this design, I decided to turn two emitters on at once, one vertical and the other horizontal. Then I only need to know if I have a detection on the horizontal or vertical axis. So that cuts down the number of computer inputs from 16 to two.

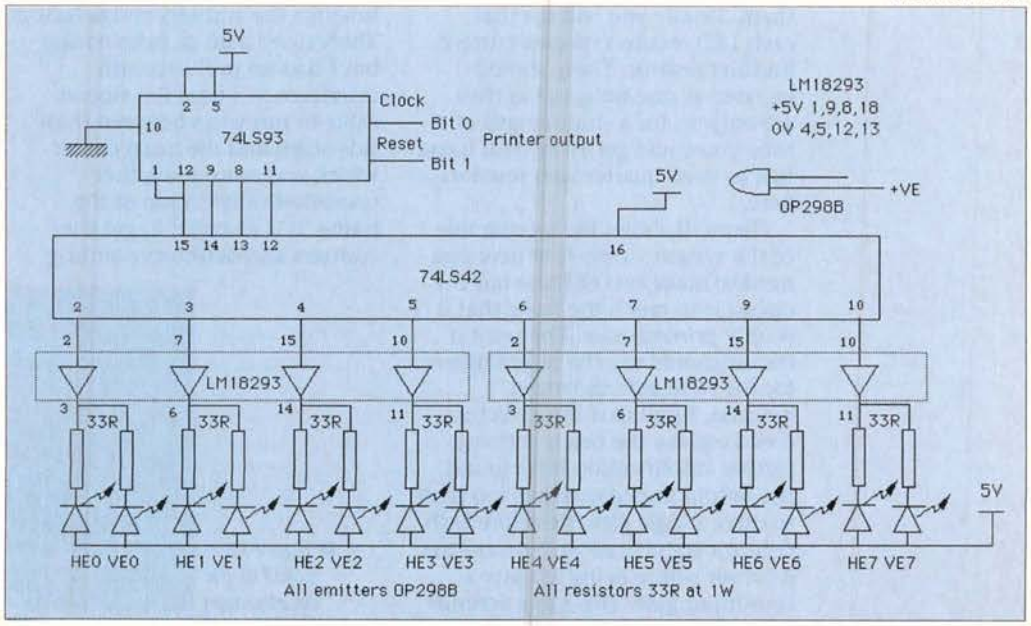
However, even turning two emitters on at a time would take eight computer outputs. The way round this is to use a counter – you see you always want to turn them on in sequence so all you need is one output to clock the counter and another to reset it. You need a reset so that you know the initial condition of the counter.

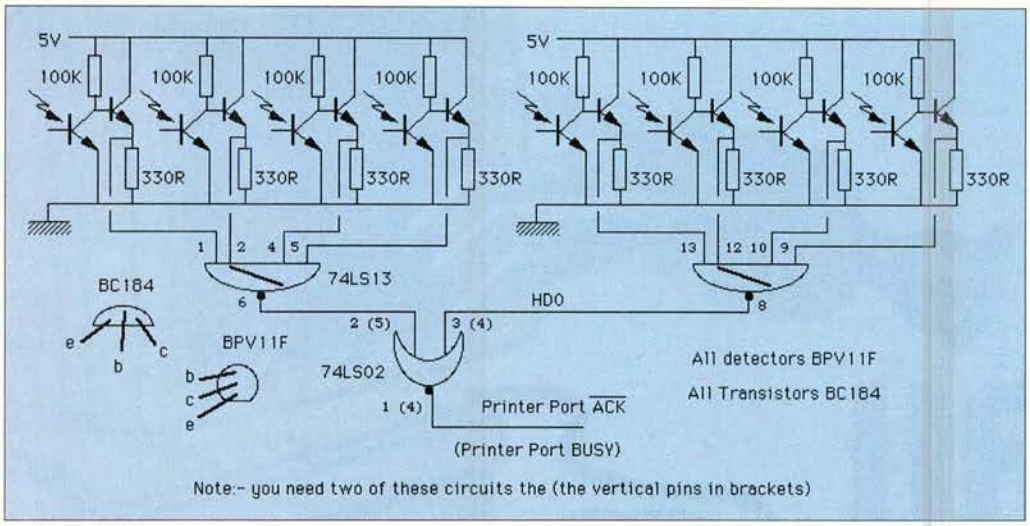
This requirement of two inputs and two outputs can be met from any number of interfaces, however I chose to use the printer port so as to leave the other interfaces free as we shall see later. You don't need a fancy bidirectional printer port, a normal one will do as you have a BUSY and an ACKnowledge input from the printer, as well as its normal outputs.

The only difference between the two types of printer port are in the software required to drive it. With the older port you need to access it directly in the supervisor mode, whereas with the new type you can use the SWI calls direct from Basic.

Figure II shows the circuit figure of the emitter side of the touch screen system. The printer outputs are fed into the clock and reset inputs of a 4-bit

● *Figure II: The circuit diagram of the IR emitters*





● *Figure III: The detector circuit*

➤

counter. This is then fed to a decimal decoder, which will put to a logic zero the output whose number is being addressed on the input lines.

In other words, if we feed it a binary count each output will go low in turn. Note here that output zero is not connected to anything, as we do not want an emitter on when the counter is reset. From here we need to boost the signal to drive two LEDs quite hard, in fact we require a drive of 300mA.

The LM18293 will provide this quite comfortably and so will other drivers. The push-pull output of this device is not really needed but I had them to hand, so I used them. Finally you will see that each LED requires its own current limiting resistor. These should be rated at one watt, but as they are only on for a short length of time you could get away with using half or even quarter watt resistors here.

Figure III shows the receive side of the system – note that here you need to make two of these but the circuit is so much the same that it is only printed once. The second circuit should use the pin numbers for the NOR gate shown in brackets. I said that the detector could register the beam without further amplification but I found the output impedance was too high to drive a logic gate, therefore each detector is buffered with an emitter follower before being fed into a four-input gate. This has a Schmitt input to remove any noise jitter. The two four-input gates are combined so that the output will go low when any detector sees a beam.

Construction of these circuits is a little tricky, simply because of the number of components involved. I mounted the emitters and resistors along with the detectors and transistors on thin strips of veroboard mounted to the inside of the frame – this is shown in Figure IV. The rest of the electronics was on a board attached to the top of the frame. With so many wires carrying quite large pulses of current you have to be careful about the earths.

For a start I earthed – connected to zero volts – the aluminium frame and ran separate 5 volt lines for the emitters and detectors. This caused a bit of extra wiring but I had no problem with interference. I used flat ribbon cable to run wires between these side strips and the main circuit which was mounted rather unaesthetically on top of the frame. It is essential to get the emitters and detectors pointing directly at one another, so a bit of judicious pushing when testing is in order.

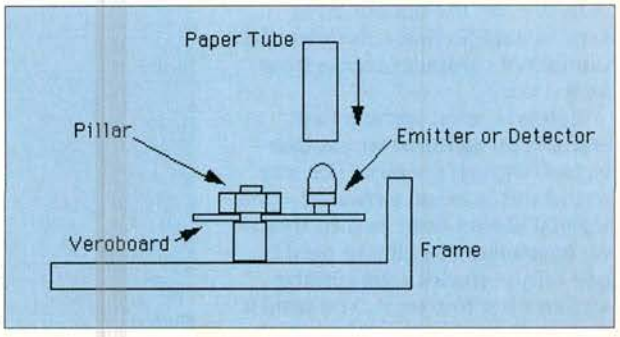
Soft addition

No project is complete without the software and here there are two stages needed. First of all you have to test the system to make sure all the beams are being produced and detected. Then you have to map the sensitive areas on to the screen, that is, identify where you touch the screen with screen coordinates. You will notice that as with any touch system there are areas of the screen that can be detected and gaps between them where detection is uncertain. The test software will help you identify these areas.

You can then use some of the routines in your own programs. One I want to try is a screen full of animals that will make the appropriate noise when you touch them. There are also the many obvious applications like on-screen information systems for open days or displays.

However, as I said at the start, there are other uses of this system not really related with a touch screen. If you take the frame off the screen you have a system that will respond to your hand position. This is a great input device for those with a physical handicap – hand movement could be translated into changing patterns or sounds. I want to try a system to link this up with the computer-controlled xylophone I made for last year's special issue. Imagine simply prodding at the air and playing a real instrument.

● *Well that about raps up 1994. Have a very merry Christmas and I will see you in the New Year.*



● *Figure IV: A detail of the construction*

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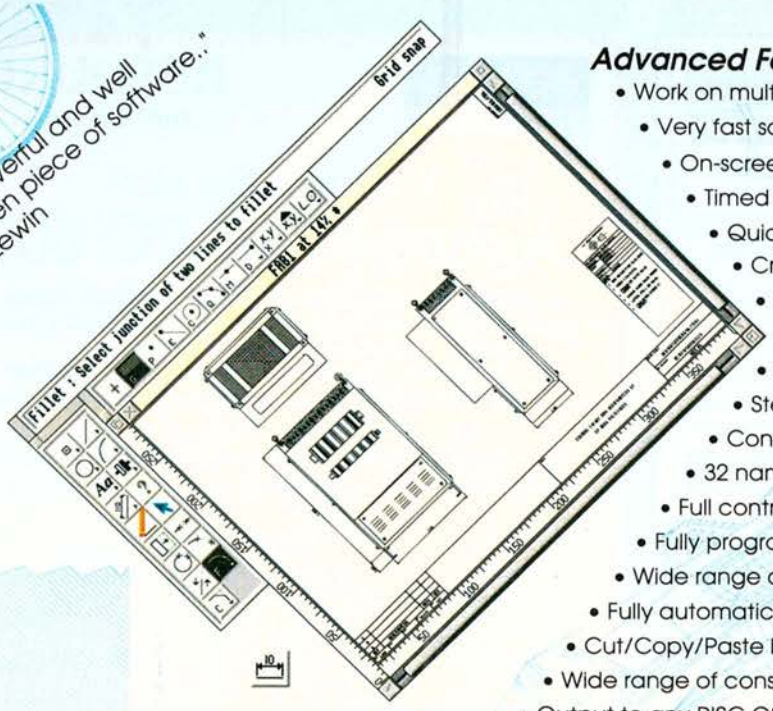

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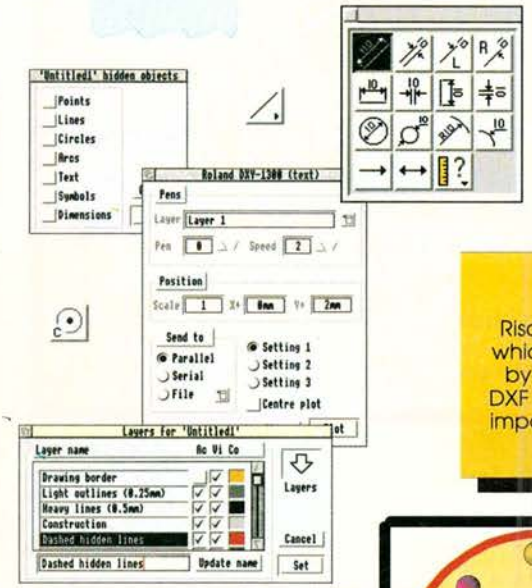

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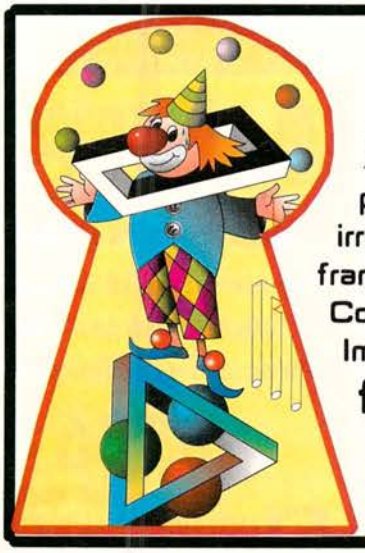

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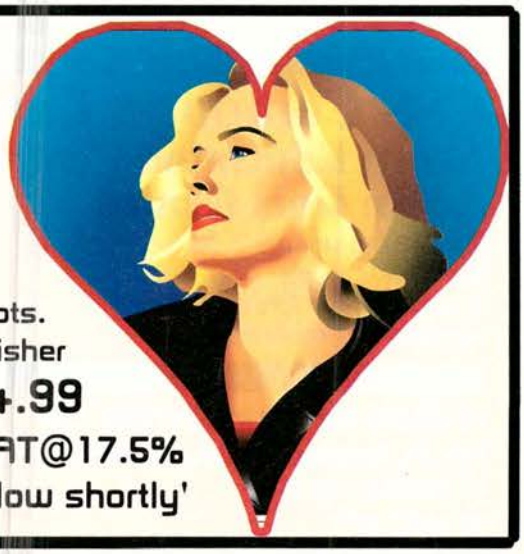

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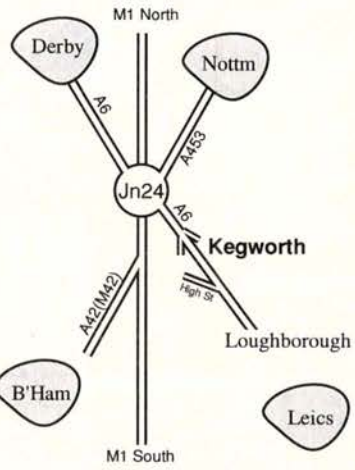

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Where is Father Christmas?

A seasonal treat for BBC Micro users by Graham Dean

THIS month the BBC Micro subscription disk is completely taken up – no free space on the 40-track version – by this seasonal presentation from teacher Graham Dean. It's a graphical adventure game that he wrote, based on a play of the same name by Pam Mossley.

Father Christmas has disappeared and it's up to you to find him so that all the presents can get delivered in time. You must explore the area around Father Christmas' workshop and the next door farm, looking for clues and hints.

The wolves are very helpful or so it seems. Just keep searching – the future of christmas is in your hands.

At each location you are given a list of the other places that can be reached from it. Unlike adventures that rely on compass directions, this one accepts input as the first letter of the target location, so if you're in the Workshop and want to go to the Orchard you press *O* – the picture for the new location is drawn and a short description of it given.

If there are any special items, you are asked what you want to do with them – these are in the form of simple yes or no replies.

The program works on all the 8-bit BBC Micros and without trouble via the !65Host on the 32-bit machines. Enjoy it and make Christmas a lot of fun.

● *A friendly-looking man, where could he be?*

● *Every option is catered for*

● *Your mission should you choose to accept it*

● *Things are a bit cold round the North Pole*

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If there seems to be a fault with one of the programs please contact us at the magazine by post describing your machine set-up and exactly what happens when you run the problem program.

What future?

BROWSING through a recent issue of EXE – billed as The Software Developer's Magazine – I noted with some interest the large number of cross-platform development systems. With portable code becoming increasingly difficult to write, owing to the increasing number of different GUIs on each platform, many developers are now using a tool to allow them to write code for one abstract GUI which is then translated to the specific calls for a particular system, for example Windows or Unix/Motif.

The systems mentioned in EXE all generated code for Windows, Windows NT, Unix/Motif, the Macintosh and OS/2 at least. Considering these are the very markets that Acorn is trying to assault, I find it very disturbing that not one of the cross-platform tools supports RISC OS.

Want to write to us? The address is: Letters, Acorn Computing, Media House, Adlington Park, Macclesfield SK10 4NP.

Of course the major limiting factors has been the lack of C++ on Acorn systems, but this has not really been rectified, even with recent developments. The best Acorn can manage is a precompiler. Easy C++ is unlikely to be competent enough to handle serious development work and GNU C/C++ does not have the class libraries or tools to make it worthwhile.

This may not, to some, seem important, but if an increasing number of systems are being developed to run on all the above platforms, then it will surely become increasingly difficult for Acorn to struggle along with its unique and non-compatible software. Acorn is being left out of the compatibility club. If RISC OS was to be represented in this growing industry, then surely it would be much more palatable for developers to produce Acorn ports of their code, without which the home-grown application market will undoubtedly run aground.

Indeed, much of the development software available on Acorn systems is currently very much behind the times. Where are the class library browsers? Where is AppWizard? Where are the object-based – as opposed to file-based – development systems?

If the Acorn community is not to be left behind in the fast moving computer world, then something must be done and done soon – or we shall surely die.

David Seery, Littleborough, Lancashire

The short answer is, all these things are coming. The detailed answer is too long to put here. As far as cross-platform tools are concerned the point of these is that adding a GUI is (relatively) easy so should it be done – the software will then immediately be available.

Acorn needs to become a little more prominent first. The cross-platform software will follow but expansion must be based on home-grown stuff first, and when you're working from home, as most developers are, you do what you can first and refine later.

Font finder general

I HAVE had a A3010 for some 18 months and have used EasyWord for my word-processing needs. I am now considering the purchase of a more advanced package, mainly so that I can use more fonts. I bought a couple of PD font disks and have been trying these out in Draw.

To make this easier I decided to increase the Font Max setting using Configure – this I had previously left at 0 – so that I do not have to do this manually each time. However, this is simply not working because when I use more fonts the cache does not increase in size.

Using *Fontlist shows that fonts are being removed from the cache rather than it increasing. I have checked the status and this shows that the Font Max value is 256k as I configured it to be. There is plenty of free memory for the cache to increase into as I have upgraded to 2Mb of ram, so with Draw and the Printer Manager loaded I have 640k in next and 512k in free.

Is this something I'm doing wrong or another example of RISC OS 3 not doing what it says in the User Guide. For instance, I've found out that saving a Desktop Boot as an Auto-Boot has no effect and I have

Question time

I have been very interested in the articles you have had about multimedia but I would like to know if the CD-Roms that come free with PC magazines can be used with the CD drives on the Risc PC.

I believe that the file sizes for multimedia are huge, I was thinking of Replay files, so will I need a second hard drive? What advantages are there to getting ArtWorks on CD-Rom? It's more expensive and the access time for CDs is slower.

As I don't understand how inkjet and laser printers handle fonts I am concerned that if I buy any of the more exotic fonts I won't be able to print them out. I am thinking about the Celtic, Gothic and Rune-type fonts. Is there an Egyptian Hieroglyph font? Or perhaps a collection of clip-art for it?

I hope you can answer my questions, they may seem obvious but I'm a complete beginner and I'm still waiting for my computer to arrive.

Mr. A. Brannan, Kingston upon Hull, N. Humberside.

The clip-art and pictures that you can get on PC CD-Roms will be usable, although you would need a PC emulator or card to make the software run.

The advantage of the ArtWorks CD-Rom is all the extra clip-art that you don't get with the floppy-disk version. The access time is barely relevant as the CD is not being continually accessed. Replay files are big but they stay on the CD-Rom.

Assuming you are using more than the most basic word processor you will be able to print anything that you get on the screen, regardless of your printer type. And there is a program called Mummy from Emerald Publishing which provides a good selection of Hieroglyphs, and if you are using a word processor that allows you to embed graphics you can use the combined system as a hieroglyphic writing system.

to issue the *Configure Boot and *Opt 4,2 commands myself.

David Lally, Glossop, Derbyshire

It's certainly true about saving a Desktop Boot not working properly, however for the fonts I think you'll find you've set the wrong value. FontMax sets a maximum limit for a variably-sized font cache – the font manager tends to throw away fonts much more often when using this. Instead you should set FontSize. This fixes the cache at a specific size and works much more efficiently.

Which computer?

FOR eight years I have owned and operated my BBC B+ with View 2, a Cumana double 40/80 disk drive and a Shinwa CPA 80P printer. During this time I have written some lengthy programs in Basic and generated a quantity of script and secretarial files.

It is time to upgrade my whole operation and get rid of the many problems inherent in the above combination. But I want to be able to use the programs and files I now have on 5.25in disk and be able to write new programs in BBC Basic, or something not too far removed. In addition, I need to be able to send script written in View2 to a new printer.

The A3010 appears on first assessment to be suitable as I am most unlikely to need more than 1Mb, having operated with 64k. I have no requirement for large games programs unless you can recommend a really good flight simulator – an ex-fighter pilot looks for a degree of realism.

My difficulty is that I have been unable to track down really informative literature and I would be most grateful if you could fill the vacuum.

Leslie G. Holland, Bristol.

There is a real problem producing "useful" literature because personal needs are so individual. The first thing to bear in mind is that moving to a 32-bit machine puts you into a completely new scale of usage – 1Mb on a 32-bit machine isn't 16 times 64k on an 8-bit machine, it's more like 4 times the size.

If I understand your letter correctly you want to run the same programs you already have, which should not be a problem, although some small changes will be needed to take the newer, more versatile, filing system into account.

And you want to do word-processing. This is slightly trickier as a decent (rather than merely adequate) word processor plus the printer manager may take more than 1Mb. Once you get into the realms of using major applications it becomes very helpful to have a hard disk, though not essential.

My best recommendation is for you to find your nearest Acorn dealer and talk to them – unlike High Street shops a dealer is someone who will understand what you want and provide good help and advice. You can find out who your nearest one is by ringing Acorn Customer Services (01223 254254)

Music to the eye

AS A professional music setter I would like to point out that Sibelius is not the only choice for producing high-quality printed music. I have been using PMS (Professional Music Scribe) for the last four years and, from the point of view of speed of musical entry, flexibility and accuracy of final output, I consider PMS to be the superior of the two in most ways.

Certainly there's no doubt that Sibelius is the better of the two for the composer who wants to write music on the screen, or for the non-technical user, as PMS takes text files as input – rather than dragging symbols as in Sibelius – and you effectively have to learn a simple programming language in order to use it. Familiarisation takes months, so it can hardly be described as easy to use.

However, from the typesetting point of view, text entry is, in the final analysis, much faster than dragging symbols on the screen, and PMS is extremely flexible in what it allows you to do – much more so than Sibelius 7.

For instance, it has its own built-in set of drawing commands which allow you to create unusual symbols that resize themselves appropriately, according to situations in which they are used.

I'm certainly not trying to knock Sibelius, I just want to make the point that, for a really meticulous typesetter who wants every aspect of the presentation to be correct, PMS is the better alternative. Clearly though, composers and techno-phobes wouldn't want to touch it.

Richard Hallas, Huddersfield, W. Yorks.

The author of PMS is: Philip Hazel, 33 Metcalfe Road, Cambridge CB4 2DB.

Connectivity

I HAVE an A4000 and am considering buying another computer so that other members of my family can use it. I would very much like to connect the two computers so that they could share devices such as the hard disk and CD-Rom drive, neither of which are SCSI devices.

I would also like to be able to print from either station to the one printer. I have heard that Cumana does such a system, but the computers have to be less than one metre away. This would be unsuitable as the computers need to be in different rooms with one room between.

Do you know a system which can achieve this? It does not really need to be anything like as sophisticated as a small network with the need to log on and so on. However, it does need the speed a normal hard disk would achieve.

If I were to go for such a system what would the situation be regarding site licenses for all my existing programs and any new ones I'd buy. It seems a very expensive way of using a computer if I must buy a site licence for just two machines.

Would my A4000 be fast enough to handle one computer accessing the hard disk while it is being used at the same time, or would you recommend a Risc PC and have the A4000 as the other computer. Would this be really necessary as money is a little tight?

A. Park, Aughton, Lancashire

A network is really what you want and, as you can read in the Acorn in the Field article, it's quite easy to achieve without the need for fileservers and the like. A simple Thin Ethernet system is what you want for the network hardware, along with Acorn Access.

Your second machine is up to you. It's always better to buy the best machine you can afford and with something as upgradable as the Risc PC the extra money is well spent – the network card is cheaper too, and doesn't use an expansion slot.

Home networks are something which we're going to see more of, and the problem of software site licences are going to become problematical.

At present I would imagine that for home use most software vendors would not be bothered. However as the systems become more common it's difficult to say.

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